272
824

[For information on kava preparation and drinking, see Category 276.]

fakafaahinga means "to act in tribes, to maintain the distinction of tribes." 613
Moreover the dictionaries equate the three words *haa, faahinga,* and *matakali.* Doubtless they are used interchangeably to-day and their former, perhaps distinct, meanings have become merged. The word *matakali* is cognate with Fijian *matanggali* (51, vol. 1, p. 264). Certainly the Fijian *matanggali* and the Tongan *haa* have much in common.

Besides being used for a division of a *haa,* the term *matakali* was used by one informant for a village as a whole. He spoke of the village of Okoa, Vavau, as forming a *matakali.* The village and island of Okoa form one of the hereditary tracts belonging to Tui Lakepa, one of the four chiefs who head divisions of the Haa Fale Fisi and it is possible that the informant was thinking of this when he said, "all of the people of Okoa form a *matakali.*" Whether he included people married into the village, as well as natives, was not ascertained.

The Haa Fale Fisi is divided into four parts: Haa Ngana of which Tui Haa Ngana is chief, and of which Nganatatafu, brother of the twentieth Tui Tonga (Tatafueikimeimua) was the eponymous ancestor; Haa Teiho of which Tui Haa Teiho is chief; Haa Ngana of which Malupo is chief; and a fourth part of which Tui Lakepa is chief. Tui Lakepa is regarded as the head of the Haa Fale Fisi as a whole. Apparently the presence or absence of *haa* subdivisions depends upon the prominence of the chiefs within a *haa* and the number of their people.

Major and minor divisions of *haa* are revealed in the Haa Ngata Motua, the most powerful and numerous lineage of modern Tonga. In this lineage, the several chiefs probably head divisions of the *haa.* The chief Ahomee heads the division Haa Vakatolo which is subdivided into four parts: (a) Haa Latakofe, to which Ahomee himself belongs and of which he is the head; (b) Haa Leleka, of which Lavaka-vao-leleva is head; (c) Haa Motua, of which Napaa is head; (d) Haa Melie, of which Mahakimata is head. Lavaka-vao-leleva, Napaa, and Mahakimata are younger brothers, either lineal or collateral, of Ahomee. Ahomee applied the term *matakali* to the four subdivisions. The god of all four subdivisions of the Haa Vakatolo [776] is Tui Fisi and the *fehi* tree is sacred to him. Ahomee stated that the or- [778] ganization of the Haa Vakatolo division of the Haa Ngata Motua is a fair [824] sample of Tongan *haa* organization.

Another example of divisions of a *haa* is presented by the Haa Motuapuaka, in which the distribution of the divisions has been obviously affected by ceremonial considerations. The Haa Motuapuaka is represented in six island groups: Tongatabu, Haapai, Vavau, Niuatoputapu, Niuafoou, and Uvea (Wallis, beyond the limits of the modern kingdom of Tonga). In each of these six island groups the Haa Motuapuaka is represented by two

The house servants of the Tui Tonga were the *vaoeiki* and the *tamaioeiki*. 643
The *vaoeiki* was a woman of the matapule class, appointed by the Tui Tonga 644
to care for his household. She had her house within the Tui Tonga's enclosure.
She was the custodian of food and supplies, and general household
manager, having charge of the other servants. It was her duty also to personally
look after the welfare and comfort of the Tui Tonga, ministering
to him when he was ill. The *tamaioeiki* were the men servants of the Tui
Tonga who actually did the work in the house in which the Tui Tonga
lived. The public was excluded from the house. A person coming to see
the Tui Tonga sat outside and told his message to a matapule, who in turn
took it to the Tui Tonga.

The salutation to the Tui Tonga was, "Malo e lakoifie ae afiona" (Being 643
well or in good health, his majesty). *"Hoo afio"* (your majesty) is employed 576
to-day of the Deity. The Tui Tonga might be addressed either in 195
the second person, *hoo*, or the third person, *ae*. "The heavens are void"
was the metaphorical announcement of the Tui Tonga's death.

A kind of garland, *lala heilala*, was worn only by the Tui Tonga and 643
the Tamaha. The *heilala* or wax flower, "formerly found growing only 301
upon the lands of the Tui Tonga," were strung like beads on a strand of 824
fau bark, no other blossoms being used, and the strings of blossoms were
formed into a rather broad, heavy band.

The Tui Tonga's hair and beard were trimmed by singeing. The envelope 643
(*loutoume*) of the immature coconut was burnt and a living coal 302
therefrom applied to the hair.

When the Tui Tonga drank the milk of a green coconut, at the same 643
time digging out the meat and eating it as he drank, he exclusively employed 412
for that purpose a fresh cut stick from the *toi* tree, the green twigs of which 272
have a sweet mint-like fragrance. 262

Jioeli Pangia, the man who perhaps would be Tui Tonga today if the 643
office had not been absorbed by the Tui Kanokupolu, gave the following 644
information as to the constitution of the Tui Tonga's immediate following
and relatives. The classifiication is purely one based upon rank and the rank
in turn based upon relationship. All of the people mentioned were relatives 643
of the Tui Tonga, though some very distantly related. 644
602

1. Fahu. Highest in rank. The elder daughter of the elder sister of the Tui Tonga was the Tamaha. Her brothers and sisters were also fahu to the Tui Tonga. [601]
2. Kaingaofi. The Tui Tonga's immediate family including himself. Of these the elder sister of the Tui Tonga held highest rank. (By immediate family is meant full brothers and sisters.) [593]
3. Matapule. Advisers and officers executing the Tui Tonga's business.
4. Kainangafonua. Official and household servants of both sexes. These were commoners.
5. Tamai o eiki. Cooks and low people.

Tui Tonga tracts in the Vavau group are: Koloa Island; Vaipoa, Vavau 643
Island; Tamamualoto, Vavau Island; Vakataumai, Kapa Island; Pulinitu, 423
near Haalaufuli, Vavau Island; Hauofa, between Haakio and Lafoou, Vavau 103
Island; Lavengahau, near Ngaakau, Vavau Island.

BOUNDARIES

In Tonga trees and ancient roads commonly served as boundary marks 423
instead of stones, which are too readily moved. Land hunger is one of the [685]
failings of the Tongans and to-day, when a noble dies, his neighbors, if [768]
possible, encroach on his *tofia*, making haste to do so before his successor
is appointed and trusting that the new owner will be ignorant of the true
boundaries. Many present day nobles are averse to having their hereditary [659]
lands surveyed by the government surveyor because this would prevent
further boundary shifting.

The *ngatae* (*Erythrina indica*) seems to have been the favorite tree for 423
marking boundaries because it grows rapidly. Coconut, *koka* and *buko* 824
trees formed more permanent boundaries, usually replacing the *ngatae* when [137]
it died. I heard that the word *ngatae* is a modern rendering of *ngatahe*
which means boundary and anciently designated the tree as well. Thus
when the Tui Kanokupolu allotted a piece of land to a follower, he said
"Ngatahe," meaning that the follower should mark the boundary by planting *ngatahe* trees.

ABSENCE OF TRUE COMMUNAL LANDS

Anciently there seems to have been no lands that were, strictly speaking, 423
communal. Perhaps the nearest approach to a communal tract was the [311]
malae or green in proximity to the house or houses of a chief, an enclosed
lawn which was used as a place of ceremonial meetings, dances, and entertainments, such as boxing and wrestling. As now used, the term *malae*
applies to a chief's burial place (the common use in eastern Polynesia) and
to the lawn area adjacent to any house.

An example of modern communal tenancy was noted in Lifuka Island. 423
Although the tract (*api*) Fiehua belongs to the Queen, in 1920 it was used 311
as a communal field for the village of Pangai, each man in Pangai having
a small section in which to plant sweet potatoes. When the potatoes were [651]
harvested, a number of basketsful were presented to the queen. However,
the coconuts which grew in this field were not the property of the townspeople. Copra was made from the nuts by the queen's caretaker, a mata- [245]
pule named John Tuione, who usually received half of the proceeds, some- [649]
times all.

There is a mound at Siesia, Nukunukumotu Island, known to be the place 846
of burial of the umbilical cord of a woman of rank, named Mafitoutai.

Nothing was learned of any special attitude towards twins (*mahanga*), 845
except that they were thought desirable.

An attempt is made to flatten the nose of the infant by pressure fre- 856
quently applied with the fingers. Large calves and small ankles, which
are regarded as a mark of beauty, are sought to be developed by frequent
massaging of the flesh of the child from the ankle upward and from the
knee downward.

GIRLS' PUBERTY OBSERVANCES

A lock of hair over one temple (called *fangafanga*) was worn by young 302
girls until virginity was lost. Thereafter the hair was cut short (shaved, 852
one informant said) from the forehead straight back to the neck. This 836
was done as soon as the loss of virginity became known, and whether the 884
loss was due to marriage or illicit relations. The daughter of a great chief [622]
might wear all her hair of her head at full length until her marriage, but [565]
not thereafter. The term *fakahaalavaka* was used to designate the par-
ticular style in which a chiefly girl of the Haa Havea wore her hair as a
sign of virginity. Baker (2) uses this term as the designation of long
hair worn as a sign of virginity by any girl.

Chiefly families still observe the ancient ceremonies connected with the 881
incipiency of womanhood. These observances were formerly general. When [565]
the first period of a daughter of a great chief arrives, her mother is notified
and then her father informed. The mother will say to him: "Our daughter
has commenced to menstruate today" The girl is then forbidden to bathe 881
during this first period, because of the belief that it would stop the flow. 841
She is painted all over with turmeric by her mother on the first day and [515]
then put to bed, as though she were sick, to remain for the rest of the [302]
period. While she is lying in bed a big feast is held, given by her father, [574]
but supervised by the father's sister. Gifts are distributed by the mother. [431]
When the flow ceases, the girl bathes. She is accompanied by an old [515]
female attendant. She and the old woman chew *tuitui* (candlenut), *langa-* [824]
kali flowers, *nukonuka* flowers, and *pako* grass root, or other sweet-smelling
plants. These masticated plants are rubbed over the body before bathing [302]
and the candlenut is used as soap.

No deity had charge of the girl during her period. Girls were not [776]
married before first menstruation. [582]

The first period of the daughter of the Tui Tonga was marked by the 643
following observances. The girl was painted with turmeric, she was for- 881
bidden to bathe, and she slept on and under black tapa to hide the blood [515]

A chief's
son was never operated on alone but always with companions. There was 881
no special tapu connected with operating on a chief's son. 622

The man performing the operation was called *faikaukau* or *faitefe*. He 881
was not a chief's appointee. The only factor in determining who could be 304
an operator was skill, involving such factors as a cool head, steady hand, [157]
previous experience, and that type of personality that tends to inspire confidence.
The operator would never be the initiate's brother or cousin, but [593]
might be his father, uncle, or any other elderly man reputed for skill in the [605]
community. An informal council of interested fathers selected the operator [604]
who was to officiate. [887]

Preceding the operation the boys bathed themselves thoroughly in the [515]
sea. This bath was called *fufulu*. After drying on a tapa towel, they were brought one at a time to the place of operation. This was usually situated outdoors under a large shady tree, the species of tree being of no importance. The spectators were the adult male relatives of the initiates. The rock, mat or large tree root on which each boy sat naked is called
hekeheka. The operator sat on the ground in front of the boy in the usual [516]
tailor fashion of Tongan men.

The cutting instrument now used is a razor. Formerly it is said to [412]
have been a bamboo knife or sharp shell. A piece of unprinted or uncolored tapa (*fetaaki*) is now wrapped round and round the razor blade, leaving only the tip of the blade exposed. The following is a description of the operation:

> A piece of bamboo was placed over the head of the penis, the foreskin drawn down over this, then the operator, with one quick stroke of the razor, or more if necessary, slit the foreskin throughout its entire superior length.
>
> Then the operator chewed the leaves of a fern called *laufale* and squeezed some
> of the juice of the masticated plant on to the incision. The cut foreskin being doubled [824]
> back around the medial portion of the penis was wrapped with the leaves of *kavakava-ulie* [752]
> from which the large fibers had been extracted. The whole was well bandaged with unprinted tapa. A girdle of this material was passed about the waist and between the legs to hold the penis against the belly. The wound was dressed twice daily.
>
> The boys, having all been operated on, were confined in a house together. No one 881
> might visit them, but their adult male relatives. Food was brought to them. They 784
> could leave the house only to defecate and urinate. The operator instructed them in
> the tapus they were to follow. They were told not to think of women. If one suffered [831]
> from erection, he pulled hard at a piece of rope (called *tukutaopeanga*) suspended
> from the rafters and the erection left him. Other tapus forbade the eating of anything [262]
> sweet, the drinking of anything but water, and only one cup of that a day, the eating of anything red, at the present day the eating of any tinned goods, the taking of a bath for five days and nights, and the performance of any heavy work or walking.
>
> In urinating the patient squatted down on his left knee, the right knee high, the 514
> body bent low over the right knee, the weight of the body supported by the right hand, 881
> while with the left hand he served himself. This position prevented the urine from running back on to the erectly held penis. If it should run back on to the penis, a swelling is said to have resulted. This caused extreme pain and even loss of life. It was called *mimi* and the squatting position described above was called *mimifakatafitafi*.

1: Gifford E-4,5 (1920-1921) 1929 OU9 Tonga OU9

Whether the indexes of group interrelations are based upon the percentage of shared names or upon the percentage of all names, certain significant breaks in the series of figures appear. Vavau is more closely tied to distant Tongatabu than to neighboring Haapai, which permits only of the interpretation that Vavau's intercourse has been greater with distant Tongatabu than with nearby Haapai. This is borne out by the absolute figures as well as by the percentages. Thus, the names exclusively shared by Tongatabu and Vavau are 98, by Haapai and Vavau but 51. The names exclusively shared by the three groups are 134. As suggested (25, p. 22), the explanation probably lies in the political supremacy of Tongatabu, from which the emissaries of the Tui Tonga were continually going forth to the other groups to collect tribute and to carry out many other missions. Both Niuafoou and Niuatoputapu seem more closely connected with Tongatabu, Haapai, and Vavau, than with each other; the figures for personal names correspond in this regard with those for place names.

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571
642
184

These tabulations for personal names manifest the same interrelations as having subsisted between different parts of the kingdom as do the tabulations for place names given in "Tongan place names". The general conclusions reached (25, pp. 22, 23) are strengthened by the findings in regard to personal names, and a diagram showing influence radiating directly from Tongatabu to the other four groups would likewise be justified.

LIST OF NAMES

551
[127]

The list of Tongan personal names here presented has been largely derived from the list of tenants in the Tongan land office and most of them are names of adult males. The distribution in the five parts of the kingdom is indicated by T for Tongatabu group, H for Haapai, V for Vavau group, NT for Niuatoputapu group, and NF for Niuafoou. Many native tree names, such as *fa* (hala, *Pandanus*). toa (*Casuarina*), and *fau* (hau, *Hibiscus*), are used alone and in combination as personal names. Tonganized English and Biblical names are included in the list. Translations are by Miss Beatrice Shirley Baker.

[824]

Afa, a hurricane; a wonder maker. T, NT
Afaki, to have ready by the time of waking.
Afakitau, sleep so as to be ready to fight. V
Afe, a thousand; to turn aside. NT
Afeafe, turn about often. H, NF
Afeaki, keep turning aside. T, H
Afei, to wrap round the body. V
Afeitaulalo, for a chief to go and visit a commoner. T, H
Afemui, to turn last, to turn aside last. T, H, V
Afi, fire. H, V, NF
Afitu, to scatter fire. H
Afoa, a small rope or string for tying the fence. T
Afu, red hot; oven cooked. T, H, V
Afuhaamango, dry without moisture. V
Afuhaapai, Afu from Haapai.
Afuhaalaufuli, Afu from Haalaufuli.
Afukaipouli, Afu do not eat until night.
Afusipa, to sleep while fishing; to only wake to pull up the hook. V
Afuvale, paper mulberry tree with too many shoots.
Ahau, the inclosure of the ruling chief; name of a place at Tongatabu. T
Ahauano, many people. H

lenga, so that it fell into the sea. The place where it slid over the edge of the 776
cliff is marked by a deep groove, through which soil and stone have slid 773
into the sea. (See also 16, p. 8.) 823

At Matalanga in Utungake, Vavau, are a series of perpendicular holes or
caves in the coral bedrock, which are said likewise to have been made by Maui
thrusting in his digging stick. In the sea close by are two very smooth rocks,
called Niumano and Moso, the larger being not more than 30 feet in diameter,
said to be transformed sons of Maui. A plant *tepilo a Maui* (wind of 776
Maui), common in Tonga, is associated with Maui. The plant, when in 773
flower, smells like human excrement and is said to have acquired this charac- 824
teristic because a branch of it was used by Maui as a wiper.

On the part of the weather shore of Uiha called Likutapu (so called 776
because a Tui Tonga is said to be buried there, in a small langi) is a hollow 773
stone called the kava bowl of Maui. 823

HIKULEO

Hikuleo, the great deity of Pulotu, whom Farmer (23, p. 132) connects 776
with the Tui Tonga, is believed to manifest himself often at the present time.
Thus, if fishermen return without a catch, it is a sign that Hikuleo has been 776
at work with his great net, and that therefore no fish will enter the nets of 226
mortals. Then the fishermen flee in fear. The particular locality where this
is believed to occur is the inland waters of such lagoons as that of Tongatabu. [115]
Mamea, the Mother Superior of the convent at Maufanga, Tongatabu, con-
tributed this information about Hikuleo's fishing. She stated, also, that there 776
died about 1905 an old woman of Maufanga who claimed that she was fre- [787]
quently transported to the smaller outer islands by a god and then subse-
quently brought back. I do not know if this god was Hikuleo.

I was unable to settle the matter of the sex of Hikuleo in her (or his) role of deity of Pulotu, some informants made the deity masculine, others feminine (26). It is not improbable that, like Fehuluni, Hikuleo was bisexual. Caillot (7, p. 243) regards Hikuleo as a male deity, as do most other writers.

At the site of the present town of Haano, Haapai, there once stood 778
a temple of Hikuleo. The temple was called Falemee. It was located on a 776
tract called Fanakava. The priest of the goddess was named Manakoto,
and her sacred animal was the sea snake (*tukuhali*). This temple was a
famous place of refuge. If a person became sick, his relatives went to [782]
Manakoto and cut off little finger joints to make him well. Bodies of exe- [755]
cuted persons were taken to Manakoto. If Manakoto were angry a human [782]
sacrifice might be made to him, the sight of which made him happy. The 000
following anecdote is told:

fanga: they immediately proceeded to his fa- 726
ther's grave, (Mr. Mariner being also with them) 669
to perform the ceremony of Toogi. All who 634
went for this purpose put on mats instead of 796
their usual dress, and wreaths made of the leaves 769
of the *ifi* tree round their necks (significant of [292]
respect and humility). They sat down cross- [824]
legged (the usual way of sitting) before the [516]
grave; Finow, as well as the rest, beating their
cheeks with their fists for about half a minute, 726
without speaking a word. One of the principal 669
matabooles then addressed the spirit of Finow's 634
father to the following purpose: "Behold the 796
"man (meaning Finow) who has come to 769
"Tonga to fight his enemies: be pleased with 782
"him, and grant him thy protection; he comes [565]
"to battle, hoping he is not doing wrong; he
"has always held Tooitonga* in the highest
"respect, and has attended to all religious cere-
"monies with exactness." One of the attend-
ants then went to Finow, and received from
him a piece of cava root, which he laid down on
the raised mount before the Fytoka (burying-
place). Several others, who had pieces of cava
root in their bosoms, went up to the grave in 726
like manner and deposited them. The cere- 669
mony being thus finished, Finow and his friends 634
431
276
796
[643]

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* Tooitonga is a great chief, supposed to be descended from a God.

2: Mariner F-5 (1806-1810) 1818
OU9 Tonga OU9

the shore in a small canoe which they had in 669
tow, and be led along the shelf by his matabooles, 728
wading through the water, which was 634
scarcely three feet deep; to this also his friends [577]
objected, being apprehensive that, if he left the
large canoe in the way he proposed, and approached
too near the beach, his temper might
be so worked into a rage by the insults of the
natives, as to induce him to rush on shore, and
run the risk of being killed; but Finow replied,
by way of apology for not yielding to
their advice, that it was the part of a brave man
to keep himself perfectly cool and collected
when insulted, and that he was resolved to act
up to this character. Matters being thus arranged,
he went into the small canoe, and was
led along by the matabooles. As they drew [578]
near to the shore, many of the natives called
out to them, saying a number of things in derision:
one threw them a piece of yam, another
a piece of pork, telling them it was to be the
last they should get from Vavaoo*; then they
enquired whether they were not quite tired of
living upon the scanty allowance of the Hapai

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* Vavaoo is famous for good yams, and great quantities [287]
of hogs, as well as for *gnatoo* of a finer quality, and better
printed; the tree, from which the printing colour is procured, [386]
being very scarce, and very inferior, at the Hapai [824]
islands. [137]

2: Mariner F-5 (1806-1810) 1818
OU9 Tonga OU9

712 strongly illuminated by the sun, represented to the imagination of Mr. Mariner the spears and javelins of ancient heroes, drawn up in battle
[714] array. On the top of the banks a number of warriors, armed with clubs and spears, were running to and fro, with fine light streamers,* full thirteen feet long, attached to their heads and arms, which, floating in the wind, produced a most romantic effect.

484 The king and his matabooles being now returned to their canoe, the expedition pro-
634 ceeded out of the inlet, and arrived shortly at a small island, on which they landed, and strip-
[722] ped it of almost all its cava root. It is here proper to mention, that all the islands adjacent to Vavaoo were deserted by order of Toe Oomoo, that the people might be more safely situated in or near the fortress, in case of an invasion. The three canoes afterwards proceeded a little farther onward, and put in for the night at a small island, called Hoonga, about two miles from Vavaoo. The next morning they resumed their voyage, and arrived at Haano, the nearest of the Hapai islands, in the afternoon.

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[824] * These streamers consist of the fine membrane stripped off from the under side of the cocoa-nut leaf.

175 up; and, as it was now almost dark, they gave
726 over the attack, and returned towards the shore, leaving us to reflect on our unhappy situation.

"The poor man I lost was John Norton: this was his second voyage with me as quartermaster, and his worthy character made me lament his loss very much. He has left an aged parent, I am told, whom he supported."

The account the natives gave was to the following purport. Part of Captain Bligh's crew had been on shore to procure water, and had all returned into their boat, except one man who was making the best of his way after his companions, with an axe in his hand; some of the natives, perceiving the axe, resolved to possess themselves of it, particularly one of them, who was a carpenter; they accordingly pursued him, and this carpenter, throwing a stone at him, knocked him down, and, coming up, beat him on the head with stones till he was dead. They then stripped the body, and dragged it up the country towards a malai, where they left it exposed two or three days,
727 and afterwards buried it near the spot. They said very little about a general attack, merely
[175] stating, that some of the natives threw stones
[726] at Captain Bligh's boat; and Mr. Mariner, at
[824] that time, not having read the narrative, did

not enquire into such particulars as he other- 727
wise would have done: but the most wonderful 824
part of the story is, that the whole track of
ground through which the body was dragged [175]
had ever since been destitute of grass, as well [726]
as the spot on which it lay for two or three days. It was this circumstance, principally, that engaged Mr. Mariner to visit the place, and there, indeed, he found the bare track of ground from the beach to near the place where they say he was buried; nor has it much the appearance of a beaten path, besides that it leads to and from places, where there are but few inhabitants: at the termination of this track there is a bare place, lying transversely, about the length and breadth of a man.

However trivial such relations may appear 771
in themselves, they are worth mentioning, with 824
a view to contrast them with the accounts given by credible travellers, that they may tend to prove how far the statements of the natives may be depended on; besides which, in some instances, as in the present, they shew what kind of superstitions they are subject to (for another instance of this kind, see the affair of the missionaries, p. 61). As to the bare track, although it may not now have much the appearance of a beaten path, owing to the grass having grown irregularly on either side, yet there

771 is every probability that, some years back, it was such, in a great degree, though now little
824 trod: but those who are willing to keep up the spirit of the wonderful have attributed it to this supernatural cause. Superstitions, in all countries, are much of the same kind; we have similar ones in our own; but, whilst men of cultivated minds disregard them, the vulgar in general most firmly give their belief, particularly where there is some sensible object that appears to corroborate the tale *.

634 Whilst Finow was yet at the Hapai islands,
276 he often held conversations at his cava parties with Filimóëátoo, respecting the state of affairs at Tonga. Among other things, this
177 chief related, that a ship from Botany Bay had
484 touched there about a week before he arrived, on board of which there was a Tonga chief, Páloo Máta Móigna, and his wife, Fataféhi, both of whom had formerly left Tonga (before the death of Toogoo Ahoo), and had resided some years at the Fiji islands, from which place they afterwards went along with one Selly (as they

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* I observe that some readers have looked upon the above explanation as if I had considered it perfectly satisfactory in regard to all the phenomena: this I did not intend: I have merely ventured to state what I consider to be the probable cause of the long track. As to the short transverse one, suffice it to say, that I do not believe it to have been occasioned by poor Norton's body.

2: Mariner F-5 (1806-1810) 1818
OU9 Tonga OU9

tabooles to the house on the *malái* at Neafoo, 643
having, besides their usual dress, small mats 669 727
round the middle, significant of its being a 728
solemn occasion, and out of respect, too, for 796
Toobo Malohi (although he came as an humble 292
suppliant), for he was a very great chief, superior [593]
even to Toobo Toa, as being his elder brother. [554]
Toobo Malohi being informed that the [301]
king was already seated in the large house on [824]
the *malái*, ready to receive him, he and his followers, [576]
being all dressed in large mats, expressive
of their very great respect, with leaves
of the *ifi* tree round their necks as a mark of
submission, went forth, with due sentiments,
thus habited, and accompanied by a priest, to a
house dedicated to Tali-y Toobó, and sat down 643
before it. The priest then addressed the divine 669
spirit that was supposed to reside there, to 727
the following purpose: "Here thou seest the 728
"men who have come from Tonga to implore 796
"thy pardon for their crimes; they have been 793
"rebels against those chiefs who hold power [782]
"from divine authority, but, being sorry for
"what they have done, they hope that thou
"wilt be pleased to extend thy protection towards
"them for the future." The priest then [824]
rose up, and laid a piece of cava root under the [788]
eaves of the house: after which he proceeded
towards Finow, with the suppliants all follow-

643
669 ing him, one close after another in the order of
727 their rank, their heads bowed down, and their
728 hands clasped before them, and, entering the
796 house on the side opposite the king, they seated
799 themselves before him and his matabooles, their
[824 hands still clasped together, and their heads
788] bowed down almost to touch the ground. After
a little time, the priest, who sat between them
and the king, addressed the latter to the following
purpose: "You here see Toobo Malohi,
"and his chiefs and followers, who have been
"to implore the pardon of Tali-y Toobó, and
"are now come to humiliate themselves before
"you: not that they expect you will pardon
"them after so obstinate a rebellion, but they
"come to endeavour to convince you of their
"sorrow for so great and heinous a crime:
"they have no expectation but to die, therefore
"your will be done*." After a short
pause, the priest again said, "pass your sentence,
643 "Finow:" he then rose up, and retired
669 among the people. In a little time, Finow
727 said to the supplicants, "*Toogooá he lo ifi*,"
728 Take off the *ifi* leaves (which is a sign of pardon):
796 of which command they took no notice,
[824] as if unwilling to believe so great a mercy was
shewn to them. Finow again said, "*Toogooá*

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* **This speech of the priest is to be considered more a matter of form than the real sentiments of the suppliants.**

2: Mariner F-5 (1806-1810) 1818
OU9 Tonga OU9

"*he lo ifi*," upon which each took off his *ifi* 643
leaves, but they all remained in the same posture. 669
Before we go further it must be observed, 727
that there were vacant places left 728
among Finow's chiefs and matabooles for 796
Toobó Malohi and his principal followers, who [824]
were of sufficient rank, to be called to after
they had received their pardon; but for a 669
great chief, circumstanced as was Toobó Malohi, 727
to obey this summons (which is always 728
pronounced by the mataboole sitting next to 796
Finow) would neither be so respectful nor so 554
prudent as to remain where he was, and take 576
no notice of it, as if altogether unworthy of being 643
so exalted; whilst a chief of less noble rank [644]
would not hesitate to obey the command, and take the seat appointed for him. All this is done upon the principle, that a great chief, so offending, ought to keep himself as humble as possible, lest, having great power and authority, he might be suspected of intentions to equalize himself with his superiors, and ultimately to revolt: whereas minor chiefs, having but little power, are not liable to excite jealousies: besides which, these minor chiefs, being governed by their superior, are thought to be less criminal than he who leads them astray by his authority. This formed a subject of dispute, beforehand, among the company:

634 of which the *fytoca* consists, may be strewed in
764 like manner, it being considered a great embellishment
to a grave to have it thus covered,
and is thought to appear very well from a distance,
where the clean sand may be seen on the
outside of the *fytoca ;* besides which, it is the
custom, and nobody can explain the reason
why,—which is the case with several of their
customs. This being done, the temporary
house is taken to pieces, and thrown behind
the *fytoca* in the hole, out of which the earth
was originally dug to raise the mount on which
the *fytoca* stands [*]: in this hole also are thrown
all the baskets in which the sand was brought,
as well as the remaining quantity of earth not
used in filling up the grave. The ground
within the *fytoca* is now covered with mats,
similar to what are commonly used in the
houses, and which are made of the leaves of
634 the cocoa-nut tree. During the whole of this
765 time the company was seated on the green before
the *fytoca*, still clothed in mats, and their
287 necks strung with the leaves of the *ifi* tree : after
301 this they arose and went to their respective habitations,
302 where they shaved their heads, and
304
824 burnt their cheeks with a small lighted roll of

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[*] Or rather the house upon the *fytoca*, for the latter is a term given merely to the mount and the grave within it; they have several *fytocas* which have no houses on them.

*tápa**, by applying it once upon each cheek 634
bone; after which, the place was rubbed with 765
the astringent berry of the *matchi*, which occasions [289]
it to bleed, and with the blood they [301]
smeared about the wound, in a circular form, [302]
to nearly two inches in diameter, giving themselves [304]
a very unseemly appearance†. They repeat [824]
this friction with the berry every day, making the wound bleed afresh: and the men, in the mean time, neglect to shave, and to oil themselves during the day; they do, however, at night, for the comfort which this operation affords. After having, in the first place, burnt their cheeks and shaved their heads, they built for themselves small temporary huts, for their own accommodation during the time of mourning, which lasts twenty days. The women, who [784]
have become *tabooed* by touching the dead body, remain constantly in the *fytoca*, except when they want food, for which they retire to one or other of these temporary houses, to be fed as mentioned in the note, p. 141, but they sleep in

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* *Tápa* differs from *gnatoo* merely by its not being stamped or imprinted with any pattern.

† Those whose love for the deceased is very great, or who wish it to be thought so, instead of burning their cheeks in the way mentioned, rub off the cuticle by beating and rubbing their cheeks with platt wound round their hands, made of the husk of the cocoa-nut; and this is a most painful operation.

perpetrator; theft, except it be consecrated 771
property. 673

16. Omens are considered direct indications of
the gods to mankind: charms or superstitious 787
ceremonies to bring evil upon any one are 789
considered for the most part infallible, as being generally effective means to dispose the gods to accord with the curse or evil wish of the malevolent invoker; to perform these charms is considered cowardly and unmanly, but does not constitute a crime.

The Tonga people universally and positively 772
believe in the existence of a large island, lying 775
at a considerable distance to the north-westward of their own islands, which they consider to be the place of residence of their gods, and of the
souls of their nobles and matabooles. This 824
island is supposed to be much larger than all 825
their own islands put together, to be well stocked with all kinds of useful and ornamental plants, always in a state of high perfection, and always bearing the richest fruits and the most beautiful flowers according to their respective natures; that when these fruits or flowers are plucked, others immediately occupy their place, and that the whole atmosphere is filled with the most delightful fragrance that the imagination can conceive, proceeding from these immortal plants;

772 [824] [825] the island is also well stocked with the most beautiful birds of all imaginable kinds, as well as with abundance of hogs, all of which are immortal, unless they are killed to provide food for the hotooas or gods; but the moment a hog or bird is killed, another living hog or bird immediately comes into existence to supply its place, the same as with the fruits and flowers; and this, as far as they know or suppose, is the only mode of propagation of plants and animals. The island of Bolotoo is supposed to be so far off as to render it dangerous for their canoes to attempt going there, and it is supposed moreover, that even if they were to succeed in reaching so far, unless it happened to be the particular will of the gods, they would be sure to 772 miss it. They give, however, an account of a Tonga canoe, which, on her return from the 773 Fiji islands a long time ago, was driven by stress of weather to Bolotoo: ignorant of the place where they were, and being much in want of provisions,—seeing the country abound in all sorts of fruit, the crew landed, and proceeded to pluck some bread fruit, but to their unspeakable astonishment, they could no more lay hold of it than if it were a shadow; they walked through the trunks of the trees, and passed through the substance of the houses, (which were built like those of Tonga,) without feeling

651 islands, and as the day of the ceremony ap-
796 proaches it becomes more frequent, so that the
244 people of almost every plantation sound the
[202] conch three or four times, which, breaking in
upon the silence of the night, has a pleasing effect, particularly at Vavaoo, where the number of woods and hills send back repeated echoes,
[824] adding greatly to the effect. The day before
the ceremony, the yams are dug up, and ornamented with a kind of ribbons prepared from the inner membrane of the leaf of a species of pandanus, and died red [*]; when thus prepared, it is called *mellecoola*, and is wrapped round the yam, beginning at one end, and running round spirally to the other, when it is brought back in the opposite direction, the turns crossing each
651 other in a very neat manner. As the ceremony
796 is always performed at the island where Tooitonga chooses to reside, the distant islands must make these preparations two or three days beforehand, that the yams, &c. may be sent in time to Vavaoo, where we will suppose the affair is to take place. The ninth day then

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[*] It is first soaked for six or eight hours in lime water, and afterwards in an infusion of the root of the *nonó*, where it remains for about a week; it is afterwards exposed to the sun, and becomes of a bright red: the root of the *nonó* is of a dark bright yellow, which, upon the action of lime water, becomes red.

539 to kekekeke; pea toki uu ki he fuu to maui ai hoo mo tama?" Pea ne toki fekau ke ave o tanu. Pea ne toki fekau ke ave o tanu ihonau tuafale; kae tanu kehe hono sino pea tanu kehe hono ngakau. Pea ka po nima, pea na tauaahi aipe, pea tupu ae sino koe fuu kava kae tupu ae ngakau koe fuu to; ka nae ikai tena ilo koe fuu kava. Pea lahi ai ae fuu kava moe fuu to. Pea hau tokua ae kuma o uu ihe fuu kava pea pea moui o lele o toutou pehe pe ta koe to koe fono ia oe kava.

Pea ihe ena lalahi leva ae ongo fuu akau, pea na taaki o ave kia Loau. Pea ihe ena fotu atu pe pea folofola mai leva a Loau, o hehe mai: "Kava mama koe kilia mei Faimata, koe tama a Fevanga mo Fefafa, ha pulu mono tata, ha kumete mono anga, ha taha ke apaapa, ha muka mono anga, ha taha ke hanga kiai ae olovaha." Pea nau ilo ai koe kava moe to.

[824] Ko hi tupuanga ia oe kava, pea oku tupu ae fisi ae kava o mafahifahi mo lahelahe hange ha kilia, he koe fefine nae kilia a Kavaonau. Pea koia oku inu ai ae kava o lahi pea fisi o hange ha kilia, he koe tupu ae kava mei he fefine nae kilia.

[826]

A [did not know that it was a kava plant.] A have you destroyed your child?" Then he told them to take it away and bury it. They told their people to bury it at the rear of their house; but the intestines and head were buried separately. And for five nights they kept visiting the grave (and after five nights) there grew from the head a big kava plant, while from the intestines there grew a big sugar-cane; but they The kava plant grew big and also the sugar cane. It is said that a rat came and chewed the big kava and became partly paralysed; then it chewed the sugar cane and recovered and ran about. The rat continually did this, which showed that the sugar cane had to be eaten with the kava.

And when the two plants were big, Fefafa and Fevanga dug them up and took them to Loau. And when they brought the plants to him, Loau saw them, and laughed and said: "Chewing kava, a leper from Faimata (in Eueiki), the child of Fevanga (To desire) and Fefafa (Carry on the back)! Bring some coconut fiber to strain it, a bowl to contain it, some one as master of ceremonies, some young leaves of the banana as a receiver (or cup), and some one for the bowl to be turned to." And they knew by this that it was kava and sugar cane.

That is the origin of the kava. The shoots of the kava grow and split and become limy (or gray) like the skin of a leper, because the woman Kavaonau was a leper. (Kava-o-nau, beard-of-their, their beard; or perhaps "their kava.") And those that drink too much kava become scaly like a leper, because the kava grew out of the body of a woman that was a leper.

THE ORIGIN OF KAVA[66]

(A Variant)

This is the story of how kava grew.

It is said that there was once a chief called Loau, whose ancestors resided in Lifuka, and for whom the district of Haaloau in Lifuka is named. It is said that his dwelling had eight enclosures or fences and that a great number of people lived there.

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[66] Told by Malakai Lavulo, of Pangai, Lifuka island, Haapai.

A [Line of text has been transposed and belongs where indicated--Analyst.]

5: Gifford E-4,5 (1920-1921) 1924 OU9 Tonga OU9

As Longopoa went his way, he forgot the instructions of the *puko* tree 539 to first plant the branch before greeting his family. Instead he went first to greet his relatives. As day dawned Longopoa remembered the branch and hastened to plant it, but it was then too late. This is the reason why the [824] *puko* tree today does not produce food, as did the *puko* tree of old. It is because Longopoa failed to obey the instructions of the ancient *puko* tree.

KOE FOLAU A KAE	THE VOYAGE OF KAE[106]
Vaka ne fau i Haamea,	Vessel was built in Haamea,
Fai la uta pea fakaheka;	Hoisted sail inland and loaded;
He vaka ne hai uta ki he lepa.	The vessel that took cargo in a pool.
"He fonua koeni e fakahela,	"This land is tiresome.
Taki taha ngaohi haane mea	Let each person prepare his own things
Ka tau folau ki he puko lea;	For us to voyage to the talking *puko* tree;
Tuku Tongatapu ka tau lelea."	Leave Tongatabu and run before the wind."
Tupa!	Clap![107]
Haapai e ka fotuaki,	Haapai was sighted,
Vavau e ka fotuaki,	Vavau was sighted,
Fai mai e tala a toutai.	Reported the navigators.
Kalo mai pe Loau, "Ikai,	Shook the head Loau, "No,
Koe loi e tuunga toutai.	The lies of the navigators.
Tau ave e kainga ni,	Let us take these friends,
Ke tuku ki tafatafaakilangi."	And leave (them) at the horizon."
Tupa!	Clap!
Pea uli hifo honau vaka;	And steered down their vessel;
Pea hokosia e tahi tea,	And arrived at the white sea,
Pea moe tahi fuofuanga,	And the floating pumice sea,
Moe tahi pupulu nae tala.	And the slimy sea that was foretold,
"Tutuu ki tahi mo eua!	"Stand to sea and ward off!
Koeha hoomou tangi na?	Why are you crying?
Ka ikai ko honau kaka	Is it not the treachery of the navigators
Pea tau mole fua ai a!"	Whereby we will all be lost!"
Tupa!	Clap!
Fokihanga folau e fuu fa;	Turning place of voyagers is the great pandanus tree;
Pea fihi ai honau fana.	There became entangled their mast.
Longopoa mo Kae e kaka;	Longopoa and Kae climbed;
Ne na feohofi ki hono vaa,	They swarmed into its branches,
Pea na tekena ai o ata.	And they pushed the vessel free.
Mole ai i he langi nae ava,	It was lost through the sky opening,
Koe potu fonua oe vava;	Into the land of space;
Koe moleanga ia oe vaka.	That was the cause of the loss of the vessel.
Tupa!	Clap!
Longopoa mo Kae, ongo otua,	Longopoa and Kae, two gods,
Ha ongo siana koia e ula,	Those two men were clever,
Kuo malie ena fakauta.	Well done was their meditation.

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[106] Reprinted from the original Tongan recitative as it appears in the Rev. Dr. J. E. Moulton's Koe Makasini a Koliji, vol. 3, pp. 58-61, 1876. Translation by Miss Beatrice Shirley Baker. [113]

[107] Each verse terminates with the word "tupa," which means "clap" and is the signal for the accompanists to beat with sticks on a mat. [533]

was able to live there. The rat, however, was in imminent danger of 539
drowning, but seeing a passing octopus, called out to it to save him. The
octopus replied: "Get on one of my tentacles," but the rat said: "No, I
am afraid of the suckers." So the octopus told him to climb on his head.

On the way to shore the rat urinated and defecated continually, but the octopus did not know it. On nearing the shore, the octopus said: "Jump ashore." The rat objected: "Not yet, the water is still too deep." The obliging octopus crawled up almost to the dry sand, so that the rat could get ashore without wetting his feet. The rat jumped ashore without thanking his rescuer and shouted: "Octopus! octopus! Feel what is on your head." The octopus did as he was bid and found a little heap of rat dung on his head, which made him exceedingly wroth.

From that day to this, the octopus has held the rat in detestation. 539
Whenever it sees a rat, its anger is at once aroused and it makes a rush 825
to catch it in its tentacles. The Tongans, knowing this, make with a
stone, two large cowry shells, and a twig, a crude resemblance of a rat, 539
which they dangle in the water as a lure. The object is called a *makafeke* 825
(octopus stone). Should an octopus be within sight, it makes a rush at 226
the imitation rat. It is undeceived only when it is dragged to the surface
and receives a smart blow on the head with a stick, or a bite just below its
head.

THE ANT AND THE RAT[139]

539

It is said that the ant and the rat were once friends. During the warm weather the rat came to see the provision the ant was making for the cold season. He came at the time that the plantain was ripe. Now in olden times the plantain was hollow in the middle, and when it was ripe its interior was sweet. The Tongan expression about a plantain of this sort is, "Its core is gathered."

When the rat came to his friends, the ants, they were inside eating the
sweet portion. The rat begged them to give him a piece, but his friends paid no
heed and went on eating themselves. The rat was angry and he took a
piece of rat's excrement and stopped up the end of the plantain, so that his
friends were smothered and died. Nowadays if you split a plantain down [824]
you will find its core like a lot of ants and a thing like rat's excrement at
the end.

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[139] Recorded by E. E. V. Collocott, of Nukualofa, Tongatabu.

tionary locale of many of the exploits of Maui, is rich in features to which are attached the names and tales of historical and legendary beings. 133

Vavau, to the north, another picturesque island, and one rich in legendary lore, is a land of beautiful wooded hills, rising to a height of 500 or 600 feet, with entrancing views of coast line and the clear emerald and blue tropical sea. On one side of the main island, islets fringe the deeply-indented shore, forming a harbor of singular loveliness, whose bays run far into the mainland and between scarcely separated islets, with everywhere the luxuriant greens of tropical foliage coming right to the water's edge.

STORIES CONNECTED WITH PLACES

TUUTAKI IN EUA

Gifford (22, p. 101) has related how the warrior Tuutaki, after defeating 539
in battle his wife's relatives, was pushed by her over the edge of a cliff, 823
in Eua, as he was drinking. The scene of his death is still pointed out. A small ledge of rock overhangs the cliff, at the foot of which is a little wood, between the cliff and the sea. Tuutaki sat resting after the labors of battle on the projecting ledge of rock. He struck the handle of his spear, of the [103]
sort called *taomataua* (double-pointed or double-faced spear) into the rock beside him. The hole he made is still to be seen, named for the spear, Taomataua. The tree on which Tuutaki was impaled when he was pushed [824]
by his wife from the cliff edge was a nutmeg (*kotone*), and the red sap of the nutmeg is called *toto-'o-Tuutaki* (blood of Tuutaki).

In a cave at the bottom of the cliff at this part of the coast is a rock which is held to resemble a canoe with people in it, and is called Vaka Fisi (Fijian-canoe). This is reputed to be the very canoe which was on its way from Fiji to attack Eua, but was deterred by the sight of Tuutaki impaled in the tree. The Fijians, ignorant of the fate of Tuutaki, supposed that he was waiting in the tree to give them battle. The way to this cave is difficult and dangerous, impracticable to all but skillful climbers, and the magnificent scenery is a fitting theater for the exploits and deaths of heroes. A belt of open grassy land, level, or gently sloping from the forest behind, fringes high cliffs, in some places rising sheer from the sea, but below Taomataua is a little wooded opening. In this opening is the stream Veefefe, which sprang from the shattered drinking-vessel of Tuutaki when he fell. Still another site associated with Tuutaki is Matapa-a-fefine, (Woman's gate). On high ground inland from these places are to be seen the remains of the trenches of a fortress which Tuutaki, supported only by his wife, is reputed to have held against a foe of vastly superior numbers. One gateway the hero left to the woman to guard, while he guarded the others.

539 well was covered, and sit at the water's edge, watching the man at his
823 work. One day the man noticed the spirit, and approached the well, but
as he drew near the spirit disappeared into the water, and covered it with
773 the rock. The man returned to his work, but presently he saw the spirit
again sitting at the water's edge. He approached, but once more the
spirit eluded him. This happened three times, and so the man knew that
the stranger was a spirit. Then he took off his turban and girdle of
leaves, and put them on a tree to make it look like a man, while he crept
round to the place toward which the spirit had turned his back as he sat
by the water. Presently the spirit came to view again, and the man
sprang upon him, and held him fast until he begged for mercy, and
promised to give the man his well. Since then the well has been uncovered,
and the stone with which it was covered is still left lying beside it.

THE CAVE TAPINGAAMAMA

539 Tapingaamama (Human affairs, manners) is the name of a cave, in
823 Tefisi in Vavau, through the walls of which there is considerable soakage.
773 Two spirits, or demons (*tevolo*) live there, one being a *toke* (eel). A
stranger once left his *vala* (kilt) in the cave while he went to bathe, and
825 when he came back he found the *vala* folded up with a rat inside it. The
[103] rat also was a *tevolo*, presumably the second spirit of the cave. Many
[266] people are said to have been lost through the cannibals who lived there.

RELATIONS WITH PULOTU

ROAD TO PULOTU

775 Gifford (22, p. 153), has published a number of stories relating to
journeys to Pulotu, abode of Hikuleo and of the souls of chiefs, an island
somewhere out to the northwest, in which are Pukolea (Speaking-puko-tree)
able to confer limitless favors, and the Vaiola (Water of life),
into which it would seem that the souls of the dead were plunged, rising
thence with eternal freshness and vigor. But, besides the far-off mystical
island, there is another Pulotu, the Underworld, which is reached by jumping
[823] into a crevice, or into the sea. Several localities are mentioned as
Hala ki Pulotu (Road to Pulotu) which, like the jumping-off places of
souls throughout so large a part of Polynesia, have a general westerly or
539 northerly outlook.[1] In the first and sixth of the stories that follow, the
773 hero plucks up a reed (*kaho*) with which the entrance of the road to
775 Pulotu is closed. This detail of the reed is found in the story of the
visits of Maui Atalanga and his son, Maui Kisikisi, to the Underworld,
824 Lolofonua, during the time that they were living in Koloa, one of the

islands of the Vavau group (14). The Underworld from which the Maui 539
came, and to which they returned, is not, however, spoken of as Pulotu, 773
but simply as Lolofonua. In the Tongan Creation Myth, indeed, Pulotu, 775
the realm of Hikuleo, is distinct from Lolofonua, the abode of the Maui. [824]
(15, p. 276).

In Tongatabu, the road or a road—to Pulotu is said to have started 539
from a spot called Haalako, on the weather shore near the village of Foui. 773
This part of the coast faces to the west, and is in the western part of the 775
island. One account would seem to make a pool (*pupu*) the actual en- 823
trance to the road, while another account says that the dead go to the
water's edge, and jump into the sea. Down below there is said to be a
great cave. Before going down to the water's edge the dead tear off a 539
branch from the shrub called uhi (according to Pratt, *Evodia hortensis*) 773
and presumably take the branch with them. This would seem to be the 775
meaning of the expression ***haaki ae uhi,*** though possibly it might mean to 824
pull the shrub up, or throw it down. In Haapai, however, the plant so 192
used is not the *uhi*, but the toa which is so sturdy a tree that tearing off
a branch is the only likely meaning. A road at Niuau nofo, the north- 539
western point of Tongatabu is named from a clump of coconut trees, 773
according to native tradition where the traveller to Pulotu plucks up a 775
reed, *kaho*. The *uhi*, which is *namu tevolo* (smelling of spirits), is one of
the most potent of medicinal plants for curing demonic possession, and 824
for preventing the wandering of ghosts from the graves of the dead (10, [103]
pp. 137-139). Thus it may be conjectured that the newly dead take [755]
branches of this shrub as a protection against the spirit dangers that await
them. An old man told me that he remembered hearing in his childhood
the expression "Kuo haaki ae uhi e sii eiki" (The poor chief has broken
off the *uhi*) used in connection with a chief who had just died. He
added the detail that at the time he heard a noise like that made by a
whale beating the sea.

In Eua, which lies a little south of the extreme easterly point of Tonga- 539
tabu, the road to Pulotu is said to commence in the sea between Eua and 773
the tiny islet Kalau, just off the southern end of Eua. In Haapai the 775
road to Pulotu seems to start in the crater of the volcanic island of Tofua, 823
which, with the splendid cone of Kao standing close beside it, forms the
western extremity of that group. "Kuo haaki ae toa" is said of the soul
which makes its way to Pulotu by jumping into the crater of Tofua. Toa 824
trees are planted about many cemeteries, though not by any means con-
fined to such positions. They are "chiefly" trees, well suited to adorn any [764]
road or compound to which it is desired to give an aspect of nobility.

6: Collocott M-5 (no date) 1928 OU9 Tonga OU9

ULUVALU

539 There was once an eight-headed demon (*nifoloa*), named Uluvalu, who
773 stole a girl and took her down to Pulotu. But a youth who loved her
plucked up the reed that closed the road to Pulotu, and went down and
775 found his sweetheart. They arranged that the girl should caress the
[824] demon's heads, and so soothe him off to sleep, and that when he was
asleep she should steal off with her lover. This was done, and the pair
returned safely to the world of men.

The *nifoloa* (long-tooth) are a class of supernatural beings, appearing
776 usually in human shape, generally maleficent, indeed cannibalistic. The
776 adjective *faka-nifoloa*, is used of that which is bizarre, outrageous. It is
impossible to make a hard and fast distinction between *nifoloa, faahikehe,*
192 *tevolo,* and *otua,* though *otua* has appreciated in dignity through its
application to the Christian Deity. Tregear (34, *niho*) mentions Ruahine-nihoniho-roroa, the Tahitian goddess of strife, cruelty, and murder.

A TRIP TO PULOTU

539 Gifford has published the well-known story (22, pp. 169-70), of which
the following is a brief version, added because of the new detail of the
773 role played by Fakafoimaka.

775 Haelefeke, Fakafoimaka (or Fakafuumaka), and Faifaimalie journeyed
[114] to Pulotu to Hikuleo, who, on their arrival, bade the denizens of Pulotu prepare food for the visitors. When the food was set before them, Hikuleo told his guests that they must eat it all, otherwise their lives would be forfeited. Haelefeke and Fakafoimaka wept, conceiving it to be impossible to consume so much food, but Faifaimalie said to leave it to her, and setting to work she ate not only the food, but the rod on which it had been carried, the basket, and the leaves with which it was covered. Nothing was left, and Hikuleo was told that it was finished.

"Uoke, Uoke," (strange) he said.

Then he bade them gather the fruit from a vi tree (*Spondias dulcis*), so laden with fruit that not a single leaf could be seen. He said that all must be collected; if one were left they should die. Then Fakafoimaka and Faifaimalie wept, but Haelefeke said to leave it to him. So he lay spread out beneath the branches, and, when the gods shook the tree, he caught all the fruit in his tentacles, not one escaped him. When Hikuleo and the spirits (*kau nifoloa*) saw this they bade the three return to the world, but they made the road rough with sharp spikes, like the thorns of the shaddock. Now Haelefeke and Faifaimalie wept, but Fakafoimaka said to leave this difficulty to him. Then he rolled about on the sharp spikes, and smoothed the road, so that they ascended safely to this world.

teeth were of ivory, and gleamed white upon the girl, and were very 539 beautiful. Then he spread two mats (*kie*), and lay with the girl. Then 773 Tuipulotu bade her take the mats, and return with her sisters to the world. 775 This is the reason of the custom in Tongan marriage of the mat of virginity, [585] *kie tangavai.*[2] So they were saved alive.

THE DEMON AND HIS HOUSE OF BEAUTIFUL MEN AND WOMEN

In this story no names are given, and the locale is not said to be Pulotu. Probably it is to be considered a brief variant of the foregoing, [177] though there are differences of detail, and the ending may have been modified by European fairy tales.

There was once a *nifoloa,* whose house was built of beautiful men and women. The house was completed but for the ridgepole. Where the ridgepole should be was a space, left vacant to be filled by a person of flawless beauty. At last the demon discovered a girl whose beauty was in every way perfect, and she was led away to fill the empty space. As she went she wept, and when she was brought into the house the faces of those already built in grinned with envy of her loveliness.

But the demon was moved and softened by her loveliness and distress, and placed a substitute for her as ridgepole. Then he took her to the seashore, and bade her slay him; but this she could not bring herself to do; so he told her to go away, and he himself leaped into the sea. Thence he returned to her a handsome young man, and married her, and dismissed to their homes the men and women who had formed his house.

LOLONGOVAVAU, DAUGHTER OF HINA AND SINILAU

Hina, the wife of Sinilau,[1] a handsome man of the midpart of Tonga, bore him a daughter. After a time Hikuleo came from Pulotu, and, entering Hina's house, bade them bring the child out into the center of the house. The parents obeyed weeping, supposing that their child was to be killed. Hikuleo ordered, however, that she be named Lolongovavau, and that she be taken to Pulotu, to be queen (*tui*) there. Hina's brother, [604] Ofamaikiatama (Love to the child), said that he would go to Pulotu to look after her.[2] So Lolongovavau was taken to Pulotu, and placed in the [824] palace (*fale hau*), and the two trees Pukolea (Speaking tree) and Akau-talanoa[3] (Talking tree) came at once, and stood, each at a doorpost, to guard the girl. There were also the guards who stood to watch.

Now the maiden was very beautiful, and when she grew up, her uncle, seeing that the time had come for her to marry, went up to the world[4] to seek a handsome man to be her husband. He commenced his search in

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came to the wall, and, as he was climbing it the hidden brother shook it, 539
and brought it down, killing the demon. Then he went on, and they all escaped.

TAFAKULA AND THE ORIGIN OF THE PAPAYA

The gods of Tonga reared a high rock on the weather side of Eua, so 539
high that Samoa could be seen from its top. The gods of Samoa resented 779
this, and came by night to remove the offending watchtower; but before they 824
had completed their task Tafakula, a goddess of Eua, took off her kilt and presented her posteriors to the Samoans. Tafakula's body[1] was of such ruddy hue that the Samoans thought the sun was rising, and fled. Then the stooping deity evacuated her bowels, and the faeces formed the first papaya fruit.

THE SAMOAN AND THE TONGAN EXCHANGE GIFTS

Long ago there were coconuts in Tonga, but not in Samoa, and there 539
were fowls in Samoa, but not in Tonga. A Samoan god asked a Tongan god for a coconut, which the Tongan agreed to give in exchange for a fowl. Each, however, prepared a deceit. Instead of a fowl the Samoan caught an owl to give to the Tongan, and the Tongan scooped the inside out of the coconut which he took, leaving only the husk. So the two met and exchanged their gifts, and as they parted the Samoan said, "Alua mo moa lulu," (Farewell with fowl owl); to which the Tongan replied, "Alua mo niu-niu[2] pulu," (Farewell with near-nut husk.)

THE TWO GIRL FRIENDS

There were once cannibals living outside the village of Haavakatolo, in a place called Talikai (Wait for food or Received and eaten), so-called because whoever went there never returned. Among these people were a man named Lolotonga and his wife. They had a little daughter, who was the friend of a young girl in the village. The two girls were inseparable, and slept in one another's homes, sometimes in the village, and sometimes in the cannibal settlement.

One night, when the girls were to sleep in the cannibal compound, Lolotonga and his wife determined to kill and eat their daughter's friend. To their own daughter they gave a string of beads (*kula*) and a wooden pillow (*hahapo*) and to the girl from the village they gave a necklace of another sort, called *toloni*. When they lay down to sleep they bade the village girl lie on the side next to themselves, and their own daughter on the side towards the wall. That night the two girls lay awake for a long time, till at last the man became angry and told them to go to sleep. But the bush

764 As the body is lying awaiting burial, people come with gifts of mats.
Much of this material is placed under the body, but when the time comes
for burial it is taken away, and distributed. The body is wrapped in a
big piece of native cloth (*ngatu*) rubbed over with oil; round this is wrapped
a mat of the kind called *fihu*, and another large piece of *ngatu* on the outside.
When the body has been thus arrayed in its grave clothes, it is placed
with the head resting on a roll of *ngatu* wrapped in a *fihu*. An European
pillow may be used, but never the ordinary wooden pillow (*kali*). While
the body is lying awaiting burial, those about it keep waving, waving over it,
[824] as though waving away flies. A plant (*uhi*) peculiarly effective in warding
off supernatural beings is very appropriate to this use. Today European
handkerchiefs or pieces of cloth are commonly used. This waving is more
or less kept up, as circumstances permit, while the body is being borne to
the cemetery, and as the corpse is lying beside the grave awaiting the actual
interment. Handkerchiefs and cloth for this waving are provided by the
family of the deceased.

The grave is not filled in with ordinary soil, but with sand from the
seashore. This sand is brought up from the beach in baskets by a crowd
764 of people. At the beach those of inferior social rank are likely to be thrown
into the sea and ducked, clothes and all. As they return to the village after
565 their work is done the women of lower social status may have their hair
cut by the crowd. All this is taken quite good-naturedly. I have seen, at
the funeral of a high chief, his widow, a middle-aged woman, go down into
the sea, fully clothed and hair loosed. Sometimes, too, the people of inferior
social rank were burned and cut at funerals. At times the burns
were in more or less regular patterns.

764 The concluding task in the actual arrangement of the grave is the bringing and placing of coarse gravel and round pebbles, usually black, though there are green pebbles on the grave of the King Taufaahau, George Tupou I, which are said to have been brought from Fiji. This task is in charge of one who is *fahu* to the dead, and to him will be brought the kava and food proper to the occasion. If the right person cannot be present, a share of the food and kava will be taken to him. Only a family which is not wealthy will do this work themselves.

765 Every morning for some days after the funeral there will be presentations of food and kava to the bereaved family. These offerings are called *pongipongi*, a word used of other ceremonial presentations of food and kava. The length of time for which this is continued depends on the rank and importance of the family concerned. On each actual occasion of the bringing of *pongipongi* the biggest chief present will be the one to whom it is given.

533 That lies spread hither and yon,
539 A thing most lovely it is,
Its dear standing shame-faced,
535 Like a wrong-doer discovered,
823 Ensnared by its loveliness.
I shall praise the strand Foiaka,
In the place of Niutao the pleasing,
Sweet *sunufea-ni* with its blooming,[1]
And the smooth white sand with its gleaming.[2]
I shall praise the eastern strand,
The quarreling (waves) of the Tauafanga;
Best of all beautiful things
Is to stand and look towards 'Onevai,
Which dear appears in the mist
Like a face upturned with smiling.
I shall praise the strand of fragrant flowers,
And the standing of Motu-tapu;
Lovely it is to me
When the wind is fair from the north,
Like the sounding of a flute
The dear murmur of swaying palms.

Chorus.
Youth, let us pace the dance,
And dance in unison;
And look upon our line of strands,
Lovely its appearance.
Aue, youth, let us dance,
And dance in unison,
And look upon our line of strands.

SONG OF FRAGRANT FLOWERS

533 In this poem occur words for many of the different plaits and ways of
making up leaves and flowers into necklaces and girdles. To a greater extent
539 than among Europeans are plants and flowers prized, not because they are
824 pretty, but because they are fragrant. Each of the six stanzas is followed
by the chorus.

Harken to me my countrymen,
This praise of mine of heart of Nua.[3]
When it is evening I remember
In love the fragrance of its odors.
It is known by whoso knows this land,
Sweet-smelling garlands the food I seek.
Harken to me, O gathering,
And I shall speak my tale
Of our headlands of fragrant flowers,
Whither resort our wanderings.
The *tuituu* and *lavalava*,[4]
Twine the *nusipalataha*,
Like an army in array;
Lifted up is the *lalaheilala*,
When merit is reckoned it is first,
See the thing that goes in beauty.
Fakaotusia and *alamea*,[5]
The armlet of a rambling man.
My *fakalotu* twined with *langakali*,[6]
Sweetly smelling from its sleep in sea water;[7]
It fills the space beneath my pillow,
And robs the mind of reason.
Hingano the lower in a double plait,[8]
Veevee and *tuituivao*,[9]
Pa'anga-pulupaki, gardenia strung together,
Faka-mata-moana is the wild *huni*.
When the dew falls I am crowned with a garland,
To be fragrant as day is at hand.
Thou who art stranger come and see,
When the flowers are op'ning on fragrant shrubs,
The headland with its blossoming
Is the thing of all most pleasing.
Plucked and strung on a ribbon's length,[8]
Fluttering in the wind the girdle's streamers,
Then it fills with the pride of beauty,
And most lovely is to me.

Chorus
Maiden, the wind is in the south,
Come dancing hither,
And blows on the pool Latai,[10]
Come dancing hither;
Let us turn to the town of faded garlands,[11]
And featly step our dances,
And pluck the *huni* and *langakali*
To wreathe our necks in this assembly.

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NOTES

Page 8. Maui in Eua

1. The *si* is apparently the well-known *Cordyline terminalis;* the leaves used in 539
making girdles, the root for sweetening food. Pratt (30) says that in Samoa the root 823
was used as food in times of scarcity. Doubtless the Tongans also ate it when other 103
food was not plentiful. 824

Pages 10-11. Stories of Tongatabu [262]

1. Vaileua, called also Touia. Possibly one name is that of the ground in which 539
the pool was situated, and the other that of the pool itself.

2. No other occurrence of the word *haulefe* is known to me. 823

3. A party which includes one chief or a number of chiefs is referred to collec- [103]
tively as *houeiki* (chiefs), and chiefly language is used with reference to them. [104]

Page 11. The well Veemumuni [195]

1. The term *vai* (water), here translated "well" is applied to lake, spring, pool [773]
of fresh water, the sea, and river, frequently without distinction, but descriptive words
are sometimes added, for example, *vai-tafe,* flowing water (river); *vai-tapu,* springing [192]
water (spring).

Page 12. Road to Pulotu

1. Smith (33, pp. 35, 36) thinks that in this duality of position of the Spirit- 775
world, which is common throughout Polynesia, there is a confusion of two meanings 823
of *raro, lalo* (*ao*), down and west.

Page 16. Tuipulotu's house in Pulotu 171

1. Tuipulotu is a frequently occurring proper name, both of men and women. 192
Mariner mentions Tuipulotu as a minor god of the sea and voyages, and protector of 539
Finau's family (28, vol. 2, p. 107).

2. Accounts of Samoan marriage ceremony are given by Kramer (26, vol. 1, p. 38); 773
by Brown (6, p. 21); and by Collocott (11). 775

Pages 17-20. Lolongovavau, daughter of Hina and Sinilau [551]

1. It is not necessary to assume that every occurrence of the names Hina and [776]
Sinilau concerns Hina, connected with moon and sea, and Sinilau or Tinirau, son of [585]
the sun, connected with sea and fishes. I have heard the Tongan opinion expressed
that there is a tendency for stories of handsome men and their beautiful wives to [776]
attach themselves to the names of Sinilau and Hina. In this tale, however, there are [538]
many features of Hina stories.

2. The mother's side of the house is subordinate to the father's, and from that [611]
side is most likely to come such a guardian as Ofamaikiatama.

3. There are frequent mentions of speaking *puko* tree, or a speaking tree, but this [604]
identification of two trees, as indicated by the two expressions, is rare. [824]

4. The expression *Alu hake ki mama* means "went up to light." The word *mama*
(light) is a usual one for the world of human beings, and for human beings them- [192]
selves; Mamani, which apparently means this light, is practically a proper name of this
world.

5. Persons greeting one another commonly refer to what the other is doing; that [576]
is, Ofamaikiatama says "Malo e maimoa" (Malo the game), and Lolomatokelau re-
plies, "Io, malo e fononga" (Yes, *malo* the journey). The word *malo,* sometimes rather [192]
colorless, expresses thanks, approval, appreciation. A very common form of greeting
of people meeting on the road is the simple question "Were you in such a place?"

6. See p. 12 for reference to roads to Pulotu. Gifford gives Niuaunofo as the [823]
northwestern point of Tongatabu. This is a few miles north from the road to Pulotu
on the weather coast near the village of Foui.

539 *Dracaena* (possibly the leaf and streamer girdle, *sisi*), or whether it is *sii* (as written), the common, usually untranslatable, word of affection.

3. Fetoa and Toloke are evidently localities represented by the suitors.

[103] 4. The champion of Veifefe is Vaenuku, from Eua. Veifefe is the name of a tiny stream in Eua. The word is also written Veefefe.

Page 51. The transformation of Vaenuku's brother

[538] 1. This is the usual ceremonious and apologetic way of commencing speech; *uta* (shore) means the dwellers in the land; *hau*, the comers to the festival at which the poem is recited.

Page 52. Auka and Talataiva

[538] 1. There is a well-known proverb, *Ko ho'o foui ne fai*, "Your *foui* did it," equivalent to "It is your own fault."

[302] [585] [837] 2. This needless betrayal of an illicit amour seems strange, but with it may be compared the painting of brides with turmeric during the marriage ceremony. I have heard, though without much confirmation, that husbands sometimes safeguarded the fidelity of their wives during their absence by painting their bellies with turmeric. Obliteration of the design was evidence of unfaithfulness. Is there, behind all this, a blood ritual connected with sexual intercourse?

[538] 3. There is a well-known proverb, *tuanaki Auka* (relying on Auka) which indicates misplaced confidence (17, no. 552).

[825] Page 58. How the vete was taken to Hihifo

1. Haitau is called also Mufutaaetau (8, p. 228).

[776] Page 59. Flea and nit go fishing

539 825 The *matakelekele* is said to be a very strange-looking fish. For Samoa, Krämer gives *mataeleele* as *filoa* before it is fully grown (26, vol. 2, pp. 417, 419). There are indications that the *matakelekele* was once worshipped, a very intelligent informant saying that he heard a man say that sacrifices were taken to it.

[103] [551] 2. Haapepe and Haatafu are names of localities in Tonga. The not infrequent occurrence in names of *pepe* (butterfly) suggests that there may have been once a butterfly clan.

Pages 59-61. The club-footed children

539 [192] 1. In the course of the story three words used of supernatural beings are used of the demon: *nifoloa, faahikehe*, and *tevolo*.

[782] [192] [197] 2. It would seem that the success of an incantation, or invocation, was achieved by preceding it by the word *tuputupu-le-fanua*. The form of the word is Samoan rather than Tongan, but it apparently is not known in Samoa, as it is not in Pratt's Dictionary. Tregear (34) defines Tuputupuwhenua as "a celebrated divine or semi-divine personage mentioned in Polynesian traditions. He is also called Tumutumuwhenua." Thus the incantation may have been originally an appeal to the being mentioned by Tregear.

[177] [845] [732] 3. The rock wall can hardly be an original feature in a Tongan story. This feature may be borrowed, or introduced lately, or the story itself may be a borrowed one into which some Tongan ideas are introduced. The mother's shame at the deformity of her children is characteristic. Tongans are more sensitive to physical blemishes than are Europeans.

Page 61. Tafakula and the origin of the papaya

[773] [824] 1. The sandalwood (*ahi*) of a ruddy brown color, is said to be especially associated with this goddess (8, p. 237).

Page 61. The Samoan and the Tongan exchange gifts

[196] [115] 1. The depreciatory effect of the reduplication of *nin* (nut) can perhaps be best rendered by the use of "near" in the sense in which it has become familiar as applied to beer. I heard this story told by Professor A. R. Brown, now of Sydney University.

539 484 505 837 8. Two copies of the text read *Pea mou o ne, o folaue;* I know no meaning for *ne* in this position, and a very intelligent Tongan emended it to *pe*.

9. It is not clear whether pray (*lotu*) is used in the Christian sense, or whether some supplication to heathen deities is meant. Mamaeaepoto lived into the Christian period.

10. Here is a sting. Ostensibly the meaning is that when affairs are all settled in the country and it is easy for all the leading men to go away on an excursion of pleasure, then "we shall go away with you on a trip." Secondarily, there is the sense that "we shall pick nice calm weather for a chap like you, who is not much of a man." Mamaeaepoto retorts that the day was a good sailing day, and secondarily, that there were not difficulties anywhere in the country that necessitated his staying.

11. Although these lines have been taken as the pretext and consolatory remarks made to Mamaeaepoto when he was left behind, it is quite possible to understand them as perfectly sincere remarks addressed by Mamaeaepoto to his companions in misfortune.

[533] 12. The word *fasi* (song, tune), stands in the margin of my copy of the poem in several places, apparently a direction for the performance of the piece. It stands opposite the lines which have *e* at the end. It is difficult to say what, precisely, is intended. Perhaps the bard recited the greater part of the poem, and a chorus joined in on the lines indicated.

13. Fusi is probably the name of a man; Fusi-momoho is the name of a boat.

[534] 14. Drums were carried on canoes, and beaten as they left, or drew near to, land, and also at other times to cheer and encourage the crews.

Pages 71-72. A poem of Falepapalangi

1. Two copies of the text have been used, and the text presented here is a little longer than either.

[361] 2. The "new boat" is a poem, or a festival, performed in Hahake, the great seat of chiefly residence. It seems that Falepapalangi was defeated, or criticised, by his rival; he replies that his composition, whose theme was the Pale, a headland in Vavau, was composed hurriedly, without much time for polishing, as the bard tossed it off in the fervor of inspiration, using the breeze of inspiration while it was blowing.

[136] [137] 3. *Telae* is a little fish that springs along on the rocks, making its way back to the sea when disturbed. The *siale* is a weak and unaggressive shrub, whose blooms fade soon after they are picked. The tropic bird cannot rise when fallen.

4. "A strife of strong fish" is proverbial for a contest of those who are strong and well-matched (17, No. 211).

5. The eminence to which the rival has attained by his victory is likened to his going up and surveying the scene from the headland of Tave in Eua.

6. This reminder that modesty is becoming may be a literal statement that the rival is not skillful at sea, as well as the figurative assertion that in the craft of the bard he has not all the gifts.

[824] 8. *Uhiuhi* is the name of a plant.

[538] 9. A very bold and effective metaphor. "Possessed" is used in the sense of demonic possession, sick.

10. Veuki is the name of Falepapalangi's compound.

[103] 11. Literally. "Wearier, wearer out, of day and night." Instead of "contest," some word such as "song" might be supplied. It is possible that he refers to some scornful question in the rival's poem as to who this Falepapalangi is.

[195] 12. In Tongan speech, especially in ceremonial speech in the presence of chiefs, it is very common to guard oneself when about to mention something that perhaps it is not polite to speak about.

[524] 13. This metaphor relates to the game of *lafo*. The position supposed is that his opponent's last throw is in scoring position, nearest to the edge of the *lafo*, also near the mat. This is the poem which has been successful. Falepapalangi has a piece of his own standing just near this. Falepapalangi is now throwing his last piece, the present poem. He will not try the shot that drives straight through, knocking the opponent's scoring piece off the mat; that would disturb his own piece, but, by taking advantage of the raised edge, or cushion, of the mat, he will come around and knock his opponent's piece off and score with two pieces of his own.

14. It is tapu for a boat to pass to windward of another boat on which there is a 539
greater chief. So Falepapalangi says to his rival that he desires to vaunt himself the [565]
greater man of the two. [784]

15. The ending seems abrupt, and possibly there are lines missing. [505]

Page 72. Falepapalangi

1. A woman freshly adorned from her toilet. Mother and new-born are also [302]
smeared with turmeric.

2. The opening of the turban allows the fragrance of the oil with which the head [846]
is anointed to escape.

3. "Chatter without going a voyage" is equivalent to "Talking about what you [302]
have never been to see, so little of a sailor that you would be sick in a pond."

4. This is sarcasm directed at the rival. "We hear the sounds of pleasure and think that the Vavau bard is amusing his fellow countrymen; but no, it turns out to be only the murmuring of the wind in the toa trees."

5. The situation of Fekitetele has evidently been long unknown. There is a fragment of a poem which refers to it as a name only whose position is unknown.

Fekite-tele te mau tala	Fekite-tele we shall tell
Koe'uhi pe hono hingoa	Only because of its name
Ka kuo 'ikai hono tu'unga.	But it has no position.

6. The homeless Vavauan is the rival, who is living in Tongatabu but has no real standing or home there. It is only by an act of grace that the chiefs of Tongatabu allow him to live with them.

Pages 72-73. A poem of Falepapalangi to Mamaeaepoto

1. Those who sail to Tongatabu, namely, the people of Haapai and Vavau.

2. Gift, the *inasi*, which was a ceremonious, religious offering of the first-fruits [651]
to the Tui Tonga, a harvest festival, was also used of the portions into which
presentations of food, mats, and the like, are divided. Probably the reference is not to [796]
the religious festival, but to the portion of a chief in any ceremony.

3. Houmahaaloau and Anamanu, both in Vavau.

4. A gesture of giving up; renouncing; having no more to do with.

5. Falalatokelau is unidentified but probably is in Vavau, and apparently the meaning of the reference is that Mamaeaepoto has given up singing the praises of Vavau.

6. Toa and *feifai* are trees used in the toilet.

7. Pangai is the court of the Tui Kanokupolu. Later on in the poem words are 539
used which would make it seem as though the Tui Tonga was the king referred to.
At the death of the last Tui Tonga in 1865 these words were formally transferred to 643
the then Tui Kanokupolu, and have continued in his house, that of the reigning family.
Even if this piece was composed before that transference, it is possible that courtesy [644]
might have allowed of the Tui Kanokupolu's being addressed in the highest terms.
Probably it is best not to press the matter too closely but merely to say the king. 539

8. Mat (*ngafingafi*) is the ordinary cincture of respect in the presence of chiefs. [291]
The *fatai*, a creeping plant, seems to have been regarded as especially appropriate to
men who had just come from the sea. Evidently the meaning here is that the king [576]
told Falepapalangi to dress himself in readiness to perform before him. [824]

9. Falepapalangi represents himself as sitting on the deck of the windward canoe and hearing, perhaps from the deck of the larger canoe, the songs and conversation, and finds that he himself, or his poem, is being criticized, presumably in a composition of Mamaeaepoto.

10. Kafoa is a hill in Vavau. Falepapalangi says that Mamaeaepoto would better compose a poem about Kafoa and leave him alone.

11. The gull (*tala*) is the poet himself, ranging for subjects, and lighting on some beautiful headland.

12. The simile, a beach where boats put in from all quarters, denotes that he is a meeting-place of many excellences, or a poet to whom many people resort, or a poet to whom many subjects furnish inspiration.

13. The meaning of this last part of the poem "I don't care what you do with my poetry; take it anywhere, to Akana (in Samoa, Aana), Tamatuitala (unidentified

539 but containing a pun, the name meaning Man-who-believes-stories), or if anyone nearer home likes it let him have it."

Page 73. Falepapalangi

[127] 1. There are many obscurities in the details of this poem, some of which might have been cleared up had a second text been available.

[538] 2. It is not clear what is meant by exchanging poems. There might possibly have been an arrangement for performing each other's pieces which was not carried out. It may be a sarcastic reference to a claim of Mamaeaepoto that they were equal in poetic skill.

3. Mamaeaepoto is in the entourage of strong chiefs.

[538] 4. The two poets sought conquests amongst the women in separate districts, and the inference seems to be that, in their art too, they had better confine themselves to separate spheres or districts. The Feleave in the text seems to be an islet in the west of Tongatabu. The *siale* and the *hangale* are taken as typical plants of the two districts.

5. The meaning seems to be that "right from the commencement of our rivalry I showed myself a man of real achievement, while you have uttered nothing but foolishness; and whereas those foolish efforts of yours have proved futile, my poems have never lost their power to please."

6. Possibly there is a secondary meaning—make love.

7. To end. Besides the obvious meaning of engaging in the sport of snaring pigeons there is the meaning of winning the favors of women, who are frequently referred to as *lupe* (pigeon). He sarcastically tells his rival that he will get sweethearts for him and his party, as they have not much freedom to do anything for themselves.

Pages 73-79. Song of Tukulua

539 1. Nothing seems to be known of Tukulua beyond this poem, which was composed during the poet's illness.

76 2. *Huni* and *siale* are names of fragrant plants.

[538] [763] [824] 3. A slight emendation of *hotau* to *hoto* would give "my" instead of "our." If the text is correct, it means the boat that ultimately bears us all away This line and the one following may be a general reference to his own past life, his days of health and happiness, or there may be something of a belief that the fortunes of his ghost ship, even in the days before his illness, were parallel to his own. But probably this should not be pressed. Through it all is perhaps recollection of the days of his strength, when even though the storm raged and his mainsheet was snapped, yet he could bring his boat safely through to land and embark his "dear desire," his sweetheart; or that he could win through all hazards because he had her with him on board.

[823] 4. Onevao is an islet off Tongatabu; Niutao is not identified. Evidently both places are associated with pleasant experiences.

5. Thunder and lightning are frequently mentioned as presaging death or disaster.

[763] [821] 6. *Pulotu 'aka'aka* should possibly be translated "widely ramified Pulotu." The word *'aka'aka* is regarded merely as an epithet of Pulotu, but the Rev. James Watkin says: "Bulotu *tete*, Bulotu *akaaka* and Bulotu *tuumau* are the names of the Tongan three heavens." Watkin was in a better position to gain information than any inquirer can be today.

[772] 7. Land of light (*mama*) is applied to the world of mortals, and to mortals themselves.

[192] [824] 8. The heilala (*Gardenia sp.*) is one of the plants used in the sweet-smelling wreaths and garlands. Leaf girdles are frequently hung at the head of graves, and are then called *tapu kakala*.

[769] 9. Pebbles, with which graves are adorned. Fatailangalanga is the name of an unidentified place.

[764] [192] 10. The reference means "Do not only give my body honorable burial, but also speak kindly of me." "Character" is *anga*. It is possible, however, that *anga* is an old word no longer known among Tongans, meaning "spirit." Compare Samoan *anganga*, thought, a disembodied spirit (32); Niue, *anganga*, the soul, spirit (35); Hawaiian, *anaana*, a prayer used to procure the death or curse upon one; witchcraft, divination, sorcery, and kindred meanings (1); and the well-known Tongan word, *angaanga*, corpse.

11. By *ma* (we) Tukulua indicates himself and one other, possibly a sweetheart. 539
It is possible that in this regretful farewell to the happy activities of living men and
women, he is thinking more particularly, though not exclusively, of the charms of 76
women's company. *Tuula* (perch for birds) would seem more likely to be applied to
women than to men; women are frequently called *lupe* (pigeon). For a possible [763]
reference underlying *tata anga lei* (place of carving ivory), see *lei mangamanga* (p. [192]
130).

12. By "games" (*tolo*) is meant the sport of dart-throwing, but possibly there [524]
is a covert allusion to love.

13. The form of the phrase *tuma 'ae fuifui puleoto* (man, lad) of cluster of
puleoto recalls the Hebrew "son of oil." The *puleoto* is a shell used for the necklaces [237]
of chiefs and is a valued ornament of chiefly virgins. To wear this shell is a mark [301]
of virginity, for if a girl who is not a virgin wears one suspended from her neck the
shell will not lie properly upon her bosom, but will turn over. [836]

14. The *motelolo* is a tree. [824]

15. There are two musical directions in my manuscript copy. The word *fasi*
apparently marks a part where those who sing the air come in, or perhaps sing alone, [533]
and the word *lautoka* is perhaps a direction to the base or seconds. The refrains that
recur throughout the piece were probably sung by the full chorus.

Page 79. On the death of the Tui Tonga

1. Langiehetupua is the name of Tui Tonga's burial vault. 539

2. The number of pigeons flying about in all the islands (*otu fonua*) was an 76
omen of the King's death.

3. In the original Tongan text *mata 'o peka* is written as three words and would 643
thus mean face (front) of *peka* (flying-fox), but the probability is that it should be
taken here as a geographical name. It is possible that the phrase may mean the faces, [764]
appearance of the people of Peka (21). Veituna also appears to be a geographical
name. Where these places are, or why they are mentioned, is not known. [763]

4. Malamaisaua (indistinctly written, and possibly Malamaisana, but Malamaisaua [787]
suits the rhyme and is in all likelihood correct) is probably a place name, perhaps the
name of the late Tui Tonga's compound; but it may be one of the names of the [825]
King himself.

5. *'Otua* means god, spirit. This direct ascription of deity to the king descended [776]
from the Lords of Heaven may perhaps be made easier by the fact that he is dead
and has returned (or is about to return?) to the land of immortals, but it seems preferable to regard it as a statement of what the Tui Tonga, the Sacred King, actually was in his status as a king, both king of mortals and a god, probably pre-eminently the god so far as men were concerned.

6. Screen (*tatau*). A screen (*kolo*) is sometimes put around the bodies of chiefs [764]
during the burial ceremony in the cemetery and, for the very great chiefs, also in the
house in which the body lay before being taken to the cemetery. Inside this screen only the *haa tufunga* (compare Maori *tohunga* and cognates in other dialects), members of the family group to whom belonged funerary arrangements, were allowed to enter.

7. Alaivahamamao, probably a *matapule* of the dead king.

8. "Midrib of the coconut leaflet" signifies the dead king. He is so called [192]
because flowers and leaves are strung on the midrib, and the name signifies him who was the center of festival for which garlands and necklaces were prepared; him to whom most of all were brought objects of pleasure and delight.

9. Manono and Fualu are names of localities in Tonga. It is possible that [103]
Manono is indicated. The statement has been made in Tonga that there is tradition that the pigeon came from Samoa to Tonga. Perhaps the most likely interpretation is that the pigeon of Manono and Fualu is the dead King, though it is possible that this is the beginning of an address to the women of Manono and Fualu, calling on them to mourn. The loss of the next five lines makes it impossible to decide.

10. At the end of the mutilated line is *evalu,* translated "eight," but of course there is nothing to show that the syllables are not, for example, the end of a name.

11. The use of the word *afio* (reign) does not mean that the king will be king [775]
of Pulotu, for Hikuleo is ruler there; but the word *afio* is used of the Tui Tonga and
has a wide range of application. It is the word used of the king's being, presence, in [192]
any place. The lines mean little more than that he will be in Pulotu, Pulotutuumau (Pulotu stand fast). If Watkin (38) is correct in thinking that the Tongans divided

539 Pulotu into three departments, is it not possible that Pulotutuumau, which the poet
regards as the destination of the Tui Tonga, may be a pleasanter place than Pulotuaka-
76 aka, to which Tukulua refers with evident repugnance. There is always the possibility
of simply descriptive epithets being applied to the same Pulotu.

643 12. In *asi-hau*, attendants of the *hau* (king), it is interesting to have a clear
[775] example of the application of the word *hau* to the Tui Tonga. *Hau* indicates kingship,
lordship actually manifest in power and rule, rather than chieftainship which is the
[192] prerogative of birth. In the later days of the Tui Tonga, when his power was
becoming gradually overshadowed by the growing might of the Tui Kanokupolu, the
[192] word *hau* was more often used of the more powerful king, and on occasion even of
other chiefs who happened for the time being to have won preeminence through military
virtue.

13. As Vavau is the northern group of the Tongan islands, evidently the king's
539 road to Pulotu takes him in a generally northerly direction. It is possible, however,
76 that this is an echo of the Vavau that occurs so widely in Polynesian tradition as
one of the stopping places in the migrations. Since the attendants rejoice when Vavau
643 has sunk out of sight, it is to be presumed that they rejoice because they have entered
on the last stage of the voyage to Pulotu. It is difficult to say whether the king is
775 regarded as having already made the voyage to Pulotu, or as being about to make it.
The only indication of time is given by *ka* in *ka maliu*, which usually marks future, or
[823] indefinite time. I have not heard a period assigned as elapsing between death and the
departure of the spirit; but the tapu on a house in which a death has occurred is
[764] removed by sprinkling water in it a few days after the death; bodies of great chiefs
are kept unburied longer than those of common people; funerary tapu for some high
[766] chiefs were kept in force for as long as a year; occasionally bodies were kept unburied
for months, even for years, apparently as a mark of special affection.

539 14. Following *ho he* in the manuscript is "etc." Apparently there were other
syllables in the refrain.

76

Pages 79-81. Koe Takipo o Nau

643 1. The opening lines refer to scenes pleasant in the life and friendship of Nau.

2. The *takafalu* is a tree. The bard and Nau used to sit in its shade.

3. This reference is not very clear and many interpretations are grammatically
766 possible. *Tuoua* and *fihupalavalu* are the names of two kinds of mats, but may be
the nicknames of two children who used to run in and out and ask to be taken to the
764 sea to bathe. Or perhaps it is meant that Nau used to go in and out of the canoe
house. Possibly Nau is the subject and reference is made to two children who used
539 to ask to be taken to bathe. Or all the lines may refer to Nau, though why she
[824] should desire to be carried to bathe is not very clear. Still there are stories of
chiefly girls who were not permitted to walk, and such stories must have some basis in
fact. The difficulty of interpretation is not lessened by the fact that instead of *fafa*
(both *a's* short), the word may be read with the last *a* long, as in fact it is marked
in the manuscript, and the meaning is then not "carry," but "grope, feel." When so
many interpretations are grammatically possible it is impossible to decide without some
information about Nau.

4. Koloa, an island and village of ancient fame. The Maui are said by a very good informant to have belonged originally to Koloa, but the exact relations of the names Vavau and Haafuluhao apparently are not very clear to modern Tongans.

764

Pages 81-82. Ulamoleka's poem on the death of Veainu

1. Makaunga is in Eua. Falepapalangi and Ulamoleka were together in Eua
539 when the news of Veainu's death reached them.

2. Two different types of waves.

3. Ohonua is the head village of Eua. A deep gully (the "vale" in the text)
[361] runs down beside the village, and opens into the sea, forming a little boat harbor.
[504] Frequently boats are weather-bound here by the heavy sea running on the bar at the
harbor mouth.

[551] 4. The reference is to Veainu. Finemua is a name for Falepapalangi.

5. Hunga is two steep, lonely rocky islets about twenty miles north of Tongatabu. Ulamoleka expresses distress and dismay at the death of Veainu, which was not unexpected when Falepapalangi and Ulamoleka left Tongatabu for Eua.

764 cord when the hunter attempts to pull it back to him, is probably the figure of courting
a girl who is yet too shy and coy to respond to the advances of her lover.

22. "That it be of comfort and use to thee on sea and land."

539 23. "Thou art skilled in its taking" signifies "Being a bard yourself, and able to
[192] carry things of this sort about with you in your mind." How skilled he was in this
taking, Falepapalangi presently proved by repeating the whole piece.

24. These lines seem to be a general approval of liberal culture.

25. This apparently is a modest depreciation of his own efforts. Anopepe is in Eua.

26. "Like a steep cliff" is the poet's inability to do justice to the dead man, or to the merits of Falepapalangi. "Two throws strike its face," a very intelligent Tongan explained as indicating a high cliff where a stone dropped from the top struck the cliff face before falling to the bottom; but since two throws are mentioned it would rather suggest throwing a stone from the bottom.

27. The mother of Hikuleo was Havealolofonua, one of the orginal goddesses,
764 born of seaweed and mud. This hint of her living with Hikuleo in Pulotu (Hikuleo
539 was the god of Pulotu) is very rare, if not unique, in Tongan myth. The Samoan god
of Pulotu was Saveasiuleo, preserving in himself both the names Havea and Hikuleo
773 (26; 15. No. 3, p. 276). An old Maui, the grandfather of Maui Kisikisi, is represented
as living in the underworld.

[776] 28. Atamusi and Atavaha are said to be two gods from Pulotu who brought some
forms of wealth to men. The wish is expressed that all the wealth brought by these
[775] two, and all the wealth brought in modern times from foreign lands could be given
to Falepapalangi to console him in his grief. There is said to have been a man living
764 in Tonga some time ago who was called the Ponepe. I have conjectured that he came
from Ponape. The war flag of France is perhaps a reference to the visit of a French
539 vessel of war in the forties of last century. Nuse is presumably New Zealand, although now the Tongans call that country Niu Sila.

[776] 29. Konaofafine (Treasure of women) is a name for Falepapalangi.

[551] Pages 82-84. Falepapalangi's last poem

1. The name Haapai stands at the head of this piece and at the end, a note that
it is the last poem of Falepapalangi.

539 2. The sneeze is not always a sign of bad luck. It is supposed to be a good
763 sign in a sick man. One informant, however, says that to sneeze in sleep is a sign
of death; a sneeze lying on right side is an omen of death on the father's side of the
539 family, if on left, of death on the mother's side, and if the one who sneezes is lying
on his back it is a sign of his own death. In ordinary usage a sneeze is greeted with
763 a laugh, as it is said to indicate that someone is in love with the person who sneezes.
This recalls the propitious sneezes in Catullus' well-known lines. To sneeze, however,
827 just before entering on some enterprise is said to be a bad sign.

3. Uluakimapa is a nickname (*hinga fakatenetene*) of some chief. These names
539 are always pleasant.

4. By this metaphor of the sea Falepapalangi indicates the coming of his sickness
763 upon him.

5. Some lines possibly have fallen out at this point. There are indicated instances
[551] of wrong procedure on the part of a *matapule*, the poet himself, in this instance. He
describes his conducting a kava ceremony without having a piece of the root before
him. He also describes some wrong disposal of the food (*fono*) served with the kava.

6. This is another sea metaphor; to come up to the wind here means "sailed well up to the wind of success."

7. The text expresses his misplaced confidence and pride; he regarded himself as a man of mark.

8. "To level the hill" is "to lay himself low."

9. Uluakiheilala is a nickname of some chief. The *heilala* is one of the plants
[55] used in the garlands and girdles. The chief, in his anxiety for Falepapalangi,
[824] gives orders for a boat to be got ready to sail to some place where there is a temple
and sanctuary, to supplicate there, and turn away the anger of the god.

[782] 9a. Heataukakapa is another nickname, probably that of a chief who was a friend
of Falepapalangi.

[551] 10. The bird of heaven is an omen, presaging the death of Falepapalangi. Kaimo-
[825] tokanga (eat and attend) is a proverbial expression for proceeding warily. The bird

539 584 103 613 551 643

place at sea, a reef, where the *tolu* are plentiful. Probably it is the proper name of a reef or stretch of sea. Halakakala is a fishing ground, a reef, of the Tui Tonga, near Eueiki. Haa Maafu is the Tui Tonga; Haa Ngata, the great house of which the Tui Kanokupolu is head. These may not be literally the names of sea localities, but introduced figuratively, because of the connection he claimed with both these houses. Tupou, the title of the Tui Kanokupolu, is also the name of several localities (21). The one whose fame is spoken of is Ulamoleka himself, named in the next line the king of the men of the ocean.

31. Here is portrayed the grief and indignation in various localities in Tonga when they hear of the affront that Ulamoleka has suffered.

345 103 778 103 821 551 552

32. Matamoana and Halaevalu are names of two pigeon-snaring mounds in Tongatabu.

33. Anganangana (Whispering hedge) is said to be a locality in Hihifo, Tongatabu. Probably it is a sanctuary, and the meaning is that the power of the temple has not been sufficiently potent for success in the undertaking.

34. Nakau and Fungaana are place names distributed in various parts of the group. Gifford notes a Fungaana in Niua Toputapu. Doubtless there is a Nakau in Niua Toputapu also.

35. Luatangata is a star name, and probably so is Alovalu. Vaea is a chief. Luatangata and Alovalu may be the nicknames of chiefs.

36. Pouvalu is noted by Gifford as the name of a house of the Tui Tonga.

37. A reminiscence of some voyage may be indicated or merely the wide extent of his travels. Probably also a hint is made of his high connections, which extend to Samoa. Tutuila is in eastern Samoa, and the Tui Kanokupolu is connected with the lords of Manua in eastern Samoa. Up until quite recently it was customary for the Tui Kanokupolu to acknowledge the connection by visits to the Tui Manua.

502 504 824

38. A sign of good seamanship is to come to the anchorage with the sail, instead of working in with oars. Kolongahau is a famous harbor of the Tui Tonga in Mua.

39. Lala is the name of a tree. This launching place is not now known. Evidently it was marked by a lála tree, or by a clump of these trees.

40. "I shall no longer base my claim to better treatment on my connection with chiefs; I shall leave that boat of high connection and strike out relying only on my own merits."

41. "Even though the way is not so good, yet I shall strike out on it."

103

42. Longoakau and Alakihaafata are the names of localities in which is spread the report of the prowess of Ulamoleka.

226

43. In the bonito fishing if a boat were full of fish, and yet caught more, the tails of the fish which could not be taken to shore were broken off, the mutilated fish were thrown back into the sea and the tails taken as trophies.

44. Haa Loau occurs as a place name in several parts of Tonga. Probably the locality indicated is in Lifuka, Haapai, where is Tongoleleka, mentioned in the next line. A scion of the Tui Tonga house still lives at Tongoleleka.

45. Probably a double strand of meaning is intended: that Ulamoleka's love will be consoled by some other woman, although it has gone through such unquiet waters, and also that his long poem is almost ended, although the bark of poesy has sailed seas of unfriendliness and misrepresentation.

46. The simile of pigeon-snaring is again employed. If there be an uneven number of birds there is great difficulty in netting them, since the odd bird flies hither and thither, seeking a mate and so disturbing all the flock. Hence, the girl Ulamoleka went to marry is a restless pigeon flying about in all directions so that he can not capture her.

47. This line is omitted in the copy printed in Koe Makasini.

48. House of the snarers (*fale fego*) is not the house on the mound where the snaring is actually done, but the house near the mound in which the cooking for the sportsmen was done.

49. "I shall make no further effort to catch this strong, far-ranging pigeon, who does not wish to be caught by me, and perhaps after all I am just as well out of it. One never knows what he has got in pigeon-hunting—and in marriage." The expression *tufa mei vao*, distributed from the bush, means "the catch is not taken home to the village and there gone through and allotted, but the distribution is done on the mound itself, and one does not see very well what he has got, but just takes his luck."

22. The plant *unuoi* is a favorite food of pigeons. Tuakilaumea presents himself as a pigeon eating *unuoi* unapprehensive of pending trouble when the news of his disgrace reached him; probably also an allusion is made to himself drinking the kava which was the cause of all the trouble. 539 644

23. The plant *pipitongi,* here used as a nickname of Tuakilaumea himself. 276

24. Moli hath done wrong, leave it to Loli, is a proverbial expression for laying the blame of one man's wrongs upon another. 687

25. This is a proverbial expression complaining that the unworthy reap the benefit of the labors and endurance of the strong and brave (17, no 92). [825]

26. Afaipaongo (little fruit of hala) is a sarcastic name for the King. The *paongo* is a valued species of *Pandanus,* and the name is constructed on the model of the nicknames of great chiefs, which frequently are of some valued and pleasant plant. The *afa* of the hala, however is the last fruit, which is smaller than the earlier fruit; and the name, therefore, is a taunt, "poor little fruit coming after the great fruit which have preceded you." [551] [551] [824]

27. Lolo was one of the handsome men whose profession was love. Tuakilaumea used the word *motua,* a common but not very respectful term for man.

28. Lotunofo; the compound of the Tui Tonga in Mua.

29. This is perhaps the request of Mumui to Tuakilaumea to live with him; but afterwards Mumui is relying on the chief Vahai of Lolopaongo a village of Foui, in western Tongatabu. But Vahai has deserted the interests of Hihifo and gone off to Hahake, where he originally belonged.

30. This is a sarcastic reference to Mumui. The direction is to "pluck the stars from heaven for this king of ours, and let all the forces of Nature be according to his pleasure." Alotolu is the belt in Orion; Toloa, the Southern Cross; Humu, dark sky near the Southern Cross (16, pp. 4-6). [821]

31. Tufuhu is a place name in Tonga, Haapai, and Vavau. Winds are named therefrom, as *funga Tufuhu* (from the surface of Tufuhu). [821]

32. Kalau is an islet off the southern end of Eua. "Below Kalau" is used of the wind blowing from a point seaward from Kalau. [821]

33. The reference is to some town where lightning was held to be an omen of war. "The town" is said to be Mumui's own town. [821]

34. Teuhie and Kaloafu are two rocks off the coast of Hihifo. The murmur of the sea is said to be heard on these rocks in calm weather, hence the expression is used here of calm seas. In these lines, in addition to the sarcastic request that Nature be as Mumui would choose, is the poet's own brooding fondness for the natural features of his native land, which is so constant a feature of Tongan poetry. [823]

35. The Kailakulaku is the boat of Ata, one of the great chiefs of the Tui Kanokupolu. The context implies "Let the canoe of this chief put out to shatter all opposition, that our King reign without a rival." [552]

36. The line *Ke tau nonofo kuo talau,* seems to have two ideas: first, that the king be equal to his job, and hence know how to treat his *matapule;* and, second that we be all alike under his rule, that is that his rule be marked by even-handed justice.

37. The phrase *fa ahi a* is not very clear. The word for sandalwood *ahi,* may be a name for the King, in which case the line would follow the preceding one and mean "That we live in justice with Ahi." I have taken *fa ahi a* as an expletive. The poet is again sarcastic at expense of Mumui.

38. There is in Vavau a cave, or depression, with sweet water in it called Tukitou. Bathing in this pool is said to make one beautiful. [823]

39. "Correctness of a maimed hand" carries with it the implication that with all its correctness of movement in the dance the maimed hand can not achieve fullness of beauty and grace.

40. The exact interpretation is uncertain but it is an expression forbidding speech. Toku is the name of an island north of Vavau, and of several other localities. [103]

42. Tuakilaumea says that he will no longer consort with Mumui.

Pages 100-102. Rhymes for the game of hiko

1. I know of no other occurrence of the form Savaiki in Tongan. 539
2. Many names in this rhyme are of chiefs. 524

6: Collocott M-5 (no date) 1928 OU9 Tonga OU9

539

Page 108. Poem of Lata

[538] 1. This poem is called *tatoka*, which is the plural of the verb *toka*, sleep (of chiefs). The poet spends the night with the chief, and amuses him and whiles away some of the hours by reciting this piece to him. The author seems to be a man of Vavau in rivalry with a bard of Tongatabu. Two bards may have recited in rivalry to amuse the chief, who would be judge and award a prize to the winner.

2. Probably the rival poem is referred to.

[669] 3. These lines introduce allusions to the fighting of Vavau and Haapai with Tongatabu in the early nineteenth century. It is not necessary to assume that the bard himself actually took part in any of the battles; but perhaps like the warriors, has come over the sea on a visit of rivalry to Tongatabu.

[824] 4. Uluakiheilala (first heilala) is a sweet-scented flower, prized both for garlands and for oil making. Here it is the nickname of some great chief.

[551] 5. Kanakana is a name found in several parts of Tonga; this pool is probably in Teekiu.

[103] 6. The meaning of this line and the one following is that danger is threatening the Tui Kanokupolu and the chiefs of Hihifo generally. Motuapuaka is one of the *matapule* of the Tui Kanokupolu. As in Finau's war, danger to Hihifo came from Vavau, the prestige of Tongatabu in verse is threatened by a man from over the sea, and it looks very much like another of Mamaeaepoto's poems composed in rivalry with Falepapalangi.

[538] 7. The course of the fighting is described with metaphors from pigeon-snaring. Matamonana is the name of a *sia* (there may have actually been fighting in its vicinity) the first phase of the contest being unpropitious, the sport is moved to the sea flats. Though the Vavau warriors are regarded as the victors in this battle, yet it led to no permanent conquest. (See p. 90.)

[103] 8. Nuku is given by Gifford as the name of a number of islets and localities scattered through Tongatabu, Haapai, and Vavau; Lata, as localities in Haapai and Niua Foou; Fafinemohuanga is not mentioned, but Gifford notes two islets of Vavau named Fafini on an Admiralty chart, which he conjectures to be a misspelling of Fafine. One of these may or may not be Fafinemohuanga (Women abounding in characteristics, that is capricious). The poet may mean that he is building figuratively a canoe of which the parts are various localities; or, that he calls on these places to furnish the different parts of the canoe.

[103] 9. Matoto; a place in Vavau.

10. "Wonder-surf," so called because of its distance from land.

11. The poet leaves his figurative language and speaks more directly.

12. The companion would seem to be the rival and the poet says that if he does not do very well himself his rival does no better.

[345] 13. In the "net-house" implements of the sport of pigeon-snaring were kept. Here metaphorically, it is the place where the contests of bards, and the general festivity of the occasion, were carried on.

[555] 14. The cloth is presented to the bards as a reward.

[551] 15. Mapaihingano is a nickname of a chief. The *mapaihingano* are the smaller segments of the fruit near the stem of the hala fruit, and the name would be that of a chief who was not the greatest, yet still perhaps a great chief. This chief might be the greatest living one, but bearing a name to which some earlier chief had given greater luster.

16. The theme of the song is Haafuluhao (Vavau), which appeals to the open (wise) mind with pleasing effect.

17. Here two meanings are introduced. The poet, a Vavau man, can not stay long in his own country, but must come to Tongatabu to entertain people there; and, keeping up the idea of composing poetry that celebrates Vavau, he soon returns from the excursion of his muse to that country to sing of Tonga.

18. The bard vaunts his successes: people come from long distances to hear him, and would be disappointed were he not there; even royalty is interested in talking about him.

[226] 19. When a boat has on board as many sharks as she can carry, and the opportunity comes to take another shark, the noose with which the shark is caught is slipped over its head and then withdrawn. This is *faka-kahoa*, literally putting on a necklace.

It is supposed that a shark thus treated is sure to be taken by the same boat on a subsequent occasion. 539

20. The words *Ho he,* laughter, indicate that the audience will enjoy his composition. This is explained as the noise of blowing on hot food, good, hot food to be thoroughly enjoyed. [226]

Page 116. Falaolongo

1. The Tongan text of this poem is headed "Sipa oe Meetaki." The word *sipa* seems more properly to be applied to a dance, or to a dance and its song, but evidently here it is used of the song as *meetaki* is one of the dances. The name Mulikihaamea also appears in the heading. The best known man of this name is the chief who was Tui Kanokupolu for a few weeks or days after the assassination of Tukuaho in 1799, and fell in the fighting of that troubled time. What connection he has with the piece is not clear. Perhaps it was first performed before him. Perhaps Mulikihaamea is the name of the bard who composed the piece, and not that of the king. Some of the places mentioned have not been identified; but probably the poem deals almost exclusively with localities in Tongatabu and its neighbor Eua. 539 533 [192] [643]

2. Falaolongo (Mat of Longo) is probably a slight elevation, natural or artificial, named after Longo, a noted warrior of Holonga, in eastern Tongatabu. A son of Longo was taken to the Tui Tonga, and grew into big boyhood in the entourage of the king, then ran away and returned to his father. This son's name was Kailahi, after whom the cave mentioned was named. [103]

3. The ninth Tui Kanokupolu, about 1780, bore the name Tuihalafatai. The naming of trees is common. [643]

4. The translation reads as though the sighing were that of the wind in the toa tree; but the line might be taken separately from the preceding line, as referring to the murmuring of the sea at Avataliapi.

5. Huafaikitama translated "meadow," may well "be a pool gleaming upward on the shore-flats." In the absence of information as to whether Huafaikitama is a pool on the coast, or a bright patch of verdure or clump of trees in the midst of grass land, it is impossible to say whether *toafa* is shore flats or meadow (downs).

6. Vailahi (Great water), one of the larger bodies of inland water in Tonga is indicated, perhaps the crater lake in Tofua, Haapai, or that of Niuafoou. It is thrown in among mention of places in Tongatabu and Eua, the inference being that the poet has lost his way, has suddenly wandered far afield. [133]

7. Veingangana (Falling water), Vaitakiafale (Led water of house), two streams on the weather coast of Eua. These streams *fekumi,* that is, they seek one another while hidden from one another, or they alternately appear and disappear in the forest. Vaitakiafale is an artificial channel leading off from the stream of which Veingangana is part. It was constructed by a chief who wished to bring the supply of water to his house. It is said, however, that *fale* may not indicate the house of the chief, but an overhanging rock under which the water flows. [103] [312]

8. "Wind from the north," would seem to indicate that the bard had wandered away from places in Tongatabu in the south, but that he now returns thither. Some of the places mentioned, for example Meitumu, are known in Vavau. But it seems best to consider all of the places as in Tongatabu and Eua, with the exception of Vailahi, and understand him as meaning that the wind of his muse is from the north throughout. Names frequently occur in more than one part of the group. 533 539 103

9. Veiatavake (Pool of the tropic bird) is the name of a pool in Eua, in a cave called Faleotaupoou (Virgin's house), where water drips down from stalactites.

10. Veitoto (Pool of blood) is apparently so called because it gleams red in the rays of the rising sun. It is in a cave in Eua, fed by a small stream which runs out of the pool and on the sea. The "dripping water blown about" is the water of this streamlet where it runs out to the coast, and is exposed to the wind.

11. Lokupo, a beach in Eua.

12. The *fatai* is a creeper with scented flowers used in garlands (*Cassytha filiformis?*). [824]

13. Fotumoko is near Fatumu, in eastern Tongatabu.

14. Sacred Coast (Liku Tapu) a portion of the weather-coast of eastern Tongatabu, sacred because of its proximity to the district where the Tui Tonga and his great chiefs lived. Laulea, near Fatumu, which is mentioned further along in the

533 tree; but its Tongan name is Malumalu o Fulilangi (Shade of Fulilangi). It is not
539 known who is the Fulilangi thus distinguished, but the name was not uncommon among
the Tui Pelehake, and has also been borne by other chiefs.

535 2. Leolava (Many voices) is probably so-called because people from many parts,
823 including other countries, for example Fiji and Samoa, congregated here in the
entourage of the Tui Tonga.

[552] 3. The town that is pleasing (*kolo fakalata*) is Mua, the Tui Tonga's capital,
scene of many pleasures.

[103] 4. Kolongahau is a stone wharf near the old-time residence of the Tui Haatakalaua.
There is also reclamation work here, undertaken when the place became the
[644] residence of the Tui Haatakalaua.

5. The word *sunufea ni* is unintelligible. Probably it is the corruption of a
[504] foreign word, not unlikely the English fern. In the last stanza of the poem the line
[192] about the wind from the north includes the word *fea-uini* (fair-wind).

6. "Smooth white sand" is a conjectural translation of *fala-sina*, white mat. The
[192] word *fala*, mat, is often used of smooth sward or sand, and *hina*, not *sina*, is the usual
Tongan form of this word.

533
Page 118. A song of fragrant flowers

1. Nua or Lotonua is a place name. There is a locality called Nua in Mua,
539 the chief village of eastern Tongatabu, and the old seat of the Tui Tonga.

2. The names *tuitui*, *lavalava*, *nusipalataha*, and *lalaheilala* are of various types
824 of leaf and flower ornaments for the neck and bosom. The generic name is *kahoa*.
[103] These, and other flower and leaf ornaments are *kakala* (sweet-smelling things).

3. Other types of flower ornaments are *fakaotusia*, *alamea*, and *fakalotu*; *fakaotusia* and *alamea* apparently are decorations for arms and ankles (*vesa*).

4. The *langakali* is a flower.

5. "Sleep in sea-water:" the flowers and leaves of a plant are sprinkled with sea-water, and left all night (*faka-mohe*) and thus their full fragrance is brought out. At night the fragrant flowers are placed underneath the wooden pillow, and so sweet are the scents that they "distract the mind."

6. The double plaiting round the top of the sisi leaf girdle is called *funganiua*, the bottom one *laloni*, and the flower *hingano* is twined into it.

7. Types of plaiting of the leaf and flower ornaments are termed *veevee*, *tuituivao*, *paangapulupaki*, and *fakamatamoana*.

8. To plait blossoms together without stringing on anything is called *kako*.

9. Ribbon, of the inner bark of the fau is called *lou*.

[103] 10. Latai, a pool on the reef, near Laulea, the famous surfriding place on the
weather coast of eastern Tongatabu.

11. The "town of faded garlands" (*kolo ngatuvai*) is Mua, whither at the time of festivals are brought so many garlands, which finally, are thrown aside and fade.

533
Page 119. Malokula.

539 1. Tonga, meaning Tongatabu.
[527] 2. Leaf of *pua* (the King, George Tupou I).
3. An enterprise large enough to collect sufficient money.

[434]
Page 119. Laughter of women

1. This probably may be considered as a love poem, at least in part. Direct
[538] expressions of love and passion are extremely rare in Tongan compositions. The
references to sport, fishing, pigeon-snaring, and surf-riding are partly literal and
partly figurative of the pursuit of love, and throughout is the sense of the pleasantness of woman's companionship.

[103] 2. Finehika is a locality in Mua.
3. The *moonia* and the *tinatila* are plants, *tinatila* is said to be like a passion-
[824] flower. Probably both are late introductions.
4. Fuaahoia is the nickname of a chief.
[551] 5. Fakimamana; locality in Mua.
6. Namalata; place name in Eua (?).
533 7. Holaavaka; beach in Eua (?).
539 8. Mohekaelanga; place probably in Eua.
103 9. Utulongoaa, the rocky coast of eastern Tongatabu.

Pages 119-120. If there be a stranger

1. This line is the refrain, sung after every line. 533

2. Haapuopuai, a pool on shore near Mua. 539

3. Talilaki, a difficult opening in the reef passed through in going by sea from Nukualofa to Mua. [103]

4. Nukufeheaki; unidentified in this locality, is probably an islet. [103]

5. The *mohokoi*, a tree with sweet-smelling flowers; is apparently that known to Europeans as ylang-ylang (*Canange odorata*). [103]

6. Apparently a woman is represented as the speaker, addressing a lover who has come over the sea, and must return to the land whence he came. Oil is given by women. [824]

7. Vaiola and Hunibush are nicknames apparently of chiefs and lovers of the speaker's own land. She would have given the stranger oil and garlands, but these other two have prevented her, at least from giving as much as she had intended. [551]

8. Halaleva is a road near Nukualofa, famed for the plentifulness of its fragrant plants and flowers. The women of this favored spot scent themselves by placing leaves in the *kona*, the fold of the *vala* at the waist. [103] [302]

9. The names mentioned in this passage are all of localities. [103]

10. The *faonelua* is a species of *Pandanus*, very rare and highly valued. One of these trees stands in Mua, and is commonly reported to be the only one in Tonga. [824]

11. Lapaha, a part of Mua. [103]

12. The reference is to *funganiua*, the *sisi*, leaf girdle and skirt, with a double row (*fungani*) of plaiting entwined with flowers, at the top. [291]

13. At Mua festivals and garlands are so common that the fragrant *sisi* is the girdle even of commoners. [291]

14. The green in Mua, Feingakotone, is where the festivals and sporting contests (*kotone*) of the Tui Tonga were held. It is not so much a name as a descriptive title of this place, *feinga* meaning doing-place, place where a thing is done. The word is much like the English Sports Ground. [368] [192]

15. Folaosioeiki, a place name. [103]

16. This line is not clear. Provisionally I have taken Takuimalae as the name of a *malae*, but taku, or *takui*, may be a tree standing on a green (*malae*).

17. Takuilau, Ahofakasiu, and Fepaki are place names; Tangitangi is probably a place name also, though the word means opening of the buds, and it is possible that the line should read, "Takuilau with opening flowers." [103]

Page 121-125. Chanties

1. "Carried astern," going astern, may mean that the chanty was sung while the canoe was going astern, or the reference may allude to something in the form of the chanty itself. The composer says that he should be rewarded with sweet-smelling garlands (*pipitongi* and *lolohea*), or that the chanty itself is pleasant like these fragrant things. For a different interpretation see Gifford (21, p. 17). [502]

2. Keitahi and Falefilimoto are localities on the weather shore of Vavau. [103]

3. The sites of Tuniloa and Tele are not identified. Both names are listed by Gifford; but not as of natural features suitable to this contest. The lookout place (*matanga*) is a commanding position whence a good view of sea or land can be obtained. The same word is used of a thing seen, a notable object; and also of the spectators at a festival. [103] [192]

4. Fangmofuike (Beach of earthquake) is a beach in Vavau, evidently where the women resort to bathe and dress their hair with lime. This is unlikely a reference to any particular woman, but a general description of what happens at this beach. [103]

5. These verses appear to be rather an ungallant address to a lady, intimating that she must look elsewhere for a lover.

6. Valefanau is a locality near Kolovai, the principal village of Hihifo. Iloituunga is probably the name of a place in the same neighborhood. [103]

7. This is an old chanty, still used in dragging sleds on which large presentations of food are placed (*toho umu*). The *pekipaki* is a sea creature popularly called blue-bottle. The singer likens himself to sea creatures able to outlast the rigors and hardships of the sea. The term *fiuanga* here means one who contends with and overcomes sea, cold, and wind. [483] [825]

533 539 8. The text implies, "People on this side and on that boast of what they can do, but one is as little able as another to give effect to his vaunt. No improvement in spite of all the talk."

9. The reference in these lines is not clear. There was a temple at Ahau, in eastern Tongatabu, and possibly the couplet celebrates the numbers of people who used to resort thither. I have never heard of women disappointed in their hopes of motherhood seeking the aid of the gods.

[824] [461] 10. The *tuo* is one sort of fine yam. The verse is applied in several ways. It is used as an admonition to the old and feeble that their active working days are over and that now cooking a little food is all the labor they are fit for. It is used as a reproach to the young and idle; that they come and work that they may eat, only old folk sitting quietly at home. It is also a reprimand to presumptuous inexperience, "If you would have these fine yams to cook and eat you must have the skill in gardening that years of experience give."

11. Plaint of the "willing horse," getting all the burdens and none of the appreciation.

[103] 12. Meilongopee (Breadfruit almost falling through overripeness) is the name of a rock near the entrance to the anchorage of the main village, also named Haano, on this island. Another prominent rock in the same anchorage is called Feleunga.

13. A plaint against the sea and its moods.

[103] 14. Telekitonga; the southernmost islet of the lonely group Otu Tolu at the southern extremity of Haapai. The northernmost of these islets is called Telekivavau.

[821] 15. Hina, the moon.

16. Toloa (Wild Duck) the constellation of the Southern Cross.

[821] [103] 17. Muitoa; a cape in the island of Haano, Haapai, at the farther extremity of that island from Foa; also an island in Haapai. The chant is composed from the point of view of one living in an island south from both of these, probably Lifuka, the political head of the Haapai group. The sarcasm is at the expense of one who can not get to the near island of Foa, but aspires to reach Muitoa, at the far end of a more distant island. It is intended as serviceable advice to those whose schemes and aspirations are constantly overlooking the fulfilment of the duty next at hand.

[483] [651] 18. This verse was chanted as the presentations of food were being dragged on to the *malae* at the ceremony of Inasi. (See 28, vol. 2, p. 170.)

19. Kalau is an islet off Eua. At one time, tradition has it, it was farther from Eua, but the god Unga (Crab) who is referred to as having left his shell, moved Kalau closer to Eua, and Kiu, Plover, objected to the removal, and flew along early in the morning to stop it.

20. The poem Taufaahau is perhaps hardly to be considered as a *tauaalo* (chanty), though part of it may have been so used. It is perhaps only a fragment of a long poem.

[103] 21. Haafeva and Kotu, islands in the western portion of Haapai. Their "island-like pleasantness, or security" may be that they are at a distance from the center of disturbance.

[103] 533 539 643 669 22. Fanganonu is a beach in Lifuka. The lines are attributed to Taufaahau, during his wars before he became Tui Kanokupolu, and supreme head of the entire Tongan group. He was preparing to go to Tonga and Eua to obtain firearms, or cannon, from Kaufana of Eua. Velata, the site of a fortress in Lifuka, Haapai, which may still be seen, was the scene of famous actions in this conflict. The war was already assuming the character of a struggle of the adherents of the older religion and policy against Christianity. In this phase of the struggle, centering in Velata, the heathen party was rallying round the Tui Tonga, who was perhaps present in person. This war is difficult to date; but from the Journal of the Reverend James Watkin (38, pp. 89, 103) it is evident that there were wars and rumors of wars in 1832 and 1833. At the conclusion of hostilities the victorious Taufaahau put the vanquished chiefs, possibly including the Tui Tonga, in canoes, and told them not to land again within the Tongan islands; but Kaunanga, the mother of Tungi, took them ashore at Lapaha. Although Taufaahau finally overthrew the power of the Tui Tonga, yet he is said to have been punctilious in observing the etiquette proper to him and his chiefs in his intercourse with them. During the fighting in Velata, Taufaahau was wounded. It is said that this is the only occasion on which he was wounded in battle. So great an impression has the wounding of this great warrior

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made on the native mind that a living Tongan, a very capable sailor and pastor of 533
the Wesleyan Church, is still pointed out as the grandson of the man who performed 539
the feat.

23. Laulea; a beach in eastern Tongatabu, suitable for surf-riding. 643

24. Anamanu and other localities mentioned are all in Vavau.

25. Kap, the high volcanic cone in the western extremity of Haapai; Lofia, the 669
crater lake in the companion island Tofua. 533

26. Kafoa, a hill in Vavau. Aloitalau, the crest of the hill Talau in Vavau.

27. I have not identified the *esi o* Koloakimaha, but it is probably one of the 539
numerous peaks on the beautiful uplands of Eua. 103

28. The *maile* is a creeping plant.

29. The *pua* is a tree with sweet-scented flowers. In *I le vao, le* is the Samoan, 533
not the Tongan, article.

30. "When one champion falls another steps forward to take his place." This 539
first line has passed into proverbial use. [824]

31. The word *tui* (pierce) is used of all piercing weapons; toa, of which clubs
were made, is used of all striking weapons. The second line is an encouragement, or [824]
incitement, to rush into battle whilst the army is still up to its full numbers. Num-
bers 29 and 30 are war chants formerly sung in the taunting which preceded the [192]
general engagement. [726]

32. The word *toho* means pull, and *io*, yes; *a mai* may possibly mean, wake up,
that is, be lively at the work. The meaning of *amatu* is not known. The word [192]
amatoi is sometimes used instead of *amatu*, with the responses *loi* or *lioi*.

33. The localities named are all in Eua. Tava is the northeastern headland of
that island; Matalave, a stream near by; Koloutukape, a fortress where a warrior [103]
defeated his foes by digging holes, and covering them with leaves of kape (*Arum
costatum*) and then inciting the enemy to run over them.

34. The *puke* is the decking at the stern and bow of a canoe. Those who sit
there take no part in the work. This chanty represents men sitting in the *puke* [501]
and resting, and then in turn taking their part in the work, and one after another
returning "badly" to the deck to rest. Why "badly" is not clear.

Page 125. Present day love songs

1. The ideas *huni* and *kulukona* (two fragrant plants) are here used to denote the absent sweetheart.

2. The name *langakali* (a sweet smelling flower) is of course used of the sweetheart. Portions of the last two lines are missing from my copy, and evidently a line is lost from the end of the second stanza.

3. The plant names *kuku-valu, hingano, huni,* and *siale-tafa* and white rose are [824]
all applied to the girl.

14. Taka i fonua mahu: Going about or living in a fruitful land. 539
181

This indicates the general prosperity and comfort of a people when crops are good and none suffers want.

15. Tatau pe tua mo palai: The *tua* just like the *palai.* 539
244
554

The *tua* and the *palai* are two sorts of yam, of which the *tua* is much the finer. That which is excellent leaves its proper excellence, becoming the mere equal of things of no account; the chief descending to be no better than the commoner.

16. Toukai mo hono lohu: A crop of fruit and its *lohu.* 539
245
[829]

The crop referred to is the breadfruit. The *lohu* is the forked stick used for picking the breadfruit. When the breadfruit is ripe a man may find that the stick that he has used in a previous season is rotten, and so he has to get another. Probably these sticks are very seldom kept from season to season. The idea is that with the crop one must get a stick for that crop. So of the needs and opportunities of a particular period the men will be found to meet them.

17. Ufilei fie ufi: An *ufilei* that wants to be a yam (*ufi*). 539
244
554
829

Ufi is the general name for all kinds of yam. The *ufi-lei* is a small sweet yam. This indicates one of these small sweet yams that wants to be some other sort of yam. Applied to people who not satisfied with being what they are try to be like someone else.

18. Utu ta lau: Harvesting, cutting off leaves.. 539
244

This is an expression from the yam harvest and indicates primarily a man who digs his yams before they are quite ready, when the tops will have died off. He strikes or cuts off the tops as he digs his crop. The application of such an expression in Tongan is similar to what it would be in English.

PLANTS AND TREES

19. Akau tuu hala: Tree standing (in a) road, and so liable to be splashed with mud, struck with knives, or otherwise injured. 539
824
[313]

This proverb or this explanation is probably modern, as before the introduction of wheeled traffic and of steel implements it would seem that the road-side tree was not exposed to especial injury. However, even under ancient conditions the road-side tree would offer itself first to those in search of timber.

20. Faifaimalie naa ke pakii ha lau telie: Go carefully lest thou pluck (break off) a *telie* (*Terminalia catappa,* or *T. litoralis*) leaf. 539
784
829

This phrase is a warning to proceed with care lest a tabu be broken. We do not know its origin.

dilatoriness in cutting down the tree had provided a mode of ingress to 539
the disturber of domestic peace; "It was your *foui* that did it." [461]

The application is exactly parallel to the English phrase that it is So-and-so's own fault. The full expression as given above is not always used, but one frequently says, "It is his own *foui*," that is, "It is his own fault."

27. Hange ha kainikavea: Like a parasite. 539

Kainikavea means a tree which has taken root in the living trunk or 824
branches of another tree finally growing so large as to envelop and conceal 571
its host. The banyan has this habit. Proverbially the phrase is used of a 829
supplanter, one who usurps the rights and privileges of another.

28. Hange ha lou milemila: Like a strip of *milemila*. 539

The *milemila* is a strip of the outer cuticle of the leaves of plants 245
such as the coconut and fan-palm. These strips turn white when dried and 824
bunches of them are used as head ornaments by warriors and dancers. 301
The expression is used of things that are thin and light, and of thin people. [826]

29. Hange ha lou vahivahi: Like a *vahivahi* leaf. 539

The *vahivahi* is a little plant found in considerable quantity on the 824
island of Eua, whose leaves are in constant motion even when the breeze 554
is scarcely perceptible. Used of one who is very obedient, is never still but 824
always running about doing the bidding of others.

30. Hange ha mahelei to: Like a strip of sugar cane. 539

Applied to a thin person, a narrow piece of cloth, and generally to 824
meagre, scanty objects, the comparison being to a thin, sharp-edged, pointed 826
piece of the outer bark of the sugar cane.

31. Hange ha niu afangia: Like a nut-tree blown by a hurricane. 539
824
522

Used especially of a man who sways with laughter, like a nut-tree swayed by the wind.

32. Hange ha niu auulu: Like a nut tree with the leaves cut off. 539

This is Tongan banter of a tall person. A coconut tree with the 824
leaves cut off is certainly a very lanky looking object. A touch of poign- 826
ancy is given to the expression by the fact that the trees so treated
are never good bearing varieties, but an unfruitful kind that nobody cares
much about.

33. Hange ha tahii toa: Like heart of iron-wood (*Casuarina equisetifolia*). 539
824
157

Hard, firm, as we say, "heart of oak."

539 **34. Hange ha tua-niu:** Like the midrib of a coconut leaflet.
824 Used of thin persons or animals, and of small, thin things in general.
826

35. Hange ha vai fa: Like pandanus water.
539 The meaning is, scattered in all directions like the water dripping on
824 all sides from the leaves of the pandanus during a shower of rain.

36. Hange ha vao masalu ngaue: Like a field of waving *masalu.*

The *masalu* is a small plant found in quantity on the prairies of the island of Eua. These plants stand close together, and when the wind blows graceful undulations pass over the surface of the field, not unlike the waves that pass through a field of standing wheat. Applies to graceful action. (Compare No. 179.)

539 **37. Hange kuo kai teve:** As though had eaten *teve* (*Amorpho-*
262 *phallus campanulatus*).
This plant causes stinging and inflammation in the mouth, and may
[137] even bring on death. (A. Krämer, Samoa-Inseln, II Band, p. 384.) By
proper treatment, however, it may be made fit for food. Used of one who has done something which he rues.

539 **38. Heka he vaa mei popo:** Getting on the branch (that is)
571 almost rotten.
This has its obvious application of depending on a weak support.

539 **39. Hoko pe fau moe fau:** Joining hibiscus with hibiscus, or
824 hisbiscus coming after hibiscus.
The comparatively tough inner bark of the wild hibiscus *(Hibiscus*
[283] *tiliaceus)* is frequently used as cord, and the expression for hibiscus to be
followed by hibiscus is very commonly employed of a strong capable man
[554] in any position being followed by another whose qualifications are equally
539 good. It is said that in former times when a Tui Tonga died the body
was not buried in the usual way, but that the head and legs were cut off
643 and replaced by the head and legs of another man slain for the purpose.
764 Should this victim be a chief the joining of his head and legs to the trunk
622 of the dead Tui Tonga was said to be a joining of the hibiscus with the
565 hibiscus. There is actual tradition of a Tui Tonga whose body had been
disfigured by a rail being supplied with limbs for burial by the devotion of another chief.

539 **40. Hoko ae fau moe polata:** Joining banana stem with hibiscus,
824 or banana stem coming after hibiscus.
554 This is the reverse of No. 39 and indicates a strong capable man
643 being succeeded by one of inferior qualifications. This too, is referred
764 to the burial of the Tui Tonga. If the man who supplied the legs and
565 head to be interred with the Tui Tonga's trunk were of low rank a piece

539
of banana stem was said to be joined to the hibiscus. A strip of the 824
banana stem of course makes a very poor ligature, being loose fibered and 554
brittle. 643
764
565

41. Hu mata niu: Entering eye of nut.

There are three depressions at the top of the coconut, but only one of 539
these marks a hole. The unskilled person might try to open the nut by 245
piercing one or other of the two false eyes, but the experienced man goes for the right hole. Hence the expression means to get right on the spot, but is used in the bad, or at all events unpopular, sense of kindness confined to one's own immediate relatives or friends; kindness confined to one particular spot.

42. Kai kape fifiji: Eating hot *kape* (*Arum costatum*). 539

One who has eaten a piece of this root at the pungent stage of its 262
growth will find his mouth so burnt that he will not be likely to join in [137]
the conversation and laughter of those about him. This picture of the man [521]
sitting silent with his stinging mouth is used of one who, ashamed of a wrong done by him, or for some such reason, sits taciturn in the company of others.

43. Koe vaavaa he koe tagata: Branchy, for 'tis man. 539

Man, with the wide and numerous ramifications of his relationships, 824
is the most branchy of all things. "Do you call so-and-so a many branched 829
thing? Why, it is nothing compared to man."

44. Malakia a moojipo: The *moojipo* trodden down. 539

This plant is frequently found in the road-ways, but lives on in spite 824
of being walked upon. So the *moojipo* has passed into a proverb of that 571
which bears up stoutly against ill-treatment and adversity; comes up smiling after every blow.

45. Mamalu a mohuku: Overshadowing of grass. 539

One is overshadowed by forest trees, and this means literally one who 461
undertakes to make a clearing on land where apparently large trees are standing, and finds that the "trees" are but weak and easily cut plants, "mere grass." So of any task seemingly formidable which, when undertaken, proves easy.

46. Motu lou-tou: Broken *tou* leaf. 539

The leaf of the *tou* (*Cordia aspera*) is very brittle; a slight pull 824
snaps the leaf completely asunder. So used of that which is broken right [137]
across, completely severed.

47. Nonofo ae makahunu moe niu motuu: The *makahunu* (hard 539
volcanic rock) living with the ripe coconut. 245

These rocks were used for making the stone adzes and were handy 412
for splitting open a coconut, and breaking it up if necessary. The phrase, 829

539 therefore, indicates the coconut living with that which destroys it. Used
245 of one who is in close contact with that which is his undoing. (Compare
412 No. 243.)
829

539 **48. Potopoto a niu mui:** Wisdom of a young nut tree.
245 A young tree will sometimes bear a crop as though it were clever at
858 that game, but will pass fruitless through another season. So children will at times behave with all the discretion of adults, but such conduct cannot be expected to be the permanent characteristic of the young.

539 **49. Tautefua a niu motuu:** A ripe nut hanging by itself.
245 There is only one nut on the stalk, but that one is perfect and ripe. A thing of which there are very few, and those few are of fine quality. A man who stands alone, but who is exceedingly capable.

539 **50. To lou oji:** Leaf fallen finished, that is, all the leaves fallen.
184 This is not a familiar form of expression in most parts of the Tongan group, in fact it is ungrammatical; it may have originated in Niua Foou where it seems that such a form is permissible. The phrase is not known, or at least not generally known in Tongatabu. Baker gives, "destitute"; poverty, or rather the poor, being represented as a tree denuded of leaves.

539 **51. Tupu lautolo:** Growing (like) *lautolo*.
824 The *lautolo* is a fast-growing, strong-creeping plant. To grow like this plant is to grow quickly and strongly.

539 **52. Tuutuu kau tala:** Stand about I'll tell.
244 Used for one who makes slighting or offensive remarks about another
578 who, unknown to the speaker, is near by and listening. There is a plantain called the *tuutuu-kau-tala*. Both the name of the plant and the meaning of the expression are connected with the legendary hero Muni, who was cast away at sea at, or before, birth and washed ashore on the island of Lofanga in Haapai. He was found and adopted by a childless couple of Lofanga, but as he grew to manhood his adoptive parents became anxious to get rid of him. Returning home one evening Muni overheard from just outside the house his supposed parents talking about him inside the house. He leaned against a plantain, of the sort now called *tuutuu-kau-tala*, and heard what they had to say. There is a couplet referring to this incident:

Hau ai o tuu kau talai	Come and stand while I abuse
Aeni ne ui ai he hopa ni.	You after whom was named this plantain.

539 **53. Ulu akaua:** Overshadowed with trees.
824 A tree that is dwarfed, unable to reach its full stature and vigor, by
571 reason of a crowd of other trees standing close about it. Used of a warrior who is overcome by the number of foes that press together upon him. Generally of one who, no matter how great his spirit and skill, is overwhelmed by the multitude of difficulties that confront him.

539 On board the *Lomipeau*, however, was a man named Lasukau who disre-
252 garded this rule and moved things round at his pleasure; but no one dared
372 to remonstrate with him because of his personal strength and prowess. For
501 one to place his *lepo* at the side of an oven is to mark that oven as his; for
571 another to move this *lepo* is to disregard the claims of the first man.

539 **60. Hina e toumohomoho:** The plantain leaves (*toumohomoho*)
252 are white.

824 Plantain and banana leaves are used for covering up food in the native oven. When the food is taken up these leaves are called *toumohomoho* and are used to line the baskets in which the food is taken to the house where it will be eaten. These leaves are then cast aside as of no further use. At first they are green, but as they fade their color becomes whitish. If one sees such leaves lying about a house their color is an indication of how long they have been there, so that to say that the leaves are white means that it is a long time since there has been a feast.

539 **61. Kailu fa he tuunga u:** To rummage for scraps in the middle
252 of the oven.

777 This is used of one whose aims are humble but who meets with an
372 unexpected stroke of luck. Just as the man who, searching for remains in places where food has been cooked or eaten, suddenly comes upon unanticipated plenty, here denoted by the middle and lowest part of the oven where the food is most in quantity and best in quality. *Tuunga u*, translated the middle of the oven, means literally the standing-place of the *u*, the stick with which the hot stones are arranged in the earth oven. This stick is used to arrange the stones up the sides of the hole, beginning at the bottom, so that the standing-place from which the stick begins its operations is the lowest and midmost part of the oven.

539 **62. Kina umu tala ki tahi:** Depending on the sea for the meat
226 part of a meal.

Looking to an uncertain source of supply; trusting to a capricious support. So many are the hazards of the sea that there is a very good chance of a late dinner if the joints cannot be found ashore.

539 **63. Kuma jii vela hono iku:** Little rat, his tail burnt.

262 Formerly the native rat, a vegetable feeder, was used for human food. The rat at best is but a small animal, and therefore when he is being cooked care should be taken not to burn his tail off. Being served with tail complete makes the most of what size he is. This expression, an expostulation against burning off the tail of the rat, has passed into a proverb for conserving as carefully as possible all there is of any small object.

174. Tolo veka aki paanga: Pelting the rail with money. 539

Apparently a late phrase coined since the arrival of European money. 825 The word *paanga*, money, is also employed to designate the large flat beans 436 or counters used in the game of *lafo*. The reference to money seems more likely. To kill the rail with pieces of money is doubly foolish. Not only is the ammunition wasted but the rail is of little use when he has been killed.

175. Tolongia pe veka kae ofi: The rail is pelted only when he 539 is close. 825

If the bird does not come near the haunts of men there will be nobody to pelt him. In the same way people will not find themselves annoyed [829] or burdened by the commands of chiefs if they keep at a distance [622] from them.

176. Aoto e manu ki Toku: The bird settles on Toku.

Toku is an islet in Vavau whither sea-birds resort in large numbers. The birds may fly far out to sea looking for food but they make for Toku to rest. Used, for instance, of a man coming home to close his days, or jocularly of a lover making for the home of his sweetheart.

177. Hange ha lupe kai kotone: Like a pigeon eating nutmeg.

The pigeon straining to swallow a nutmeg nearly chokes himself, and has to stretch up his head and neck to get the nutmeg down. Used [828] of one who has something on his mind, or who for some other reason sits in company with his head up and an absent-minded expression. The appearance of such a one is compared to that of the straining bird. (Compare Nos. 146 and 167.)

178. Hange ha mata'i moho vao: Like the eye of a wild *moho*.

Moho is the name of a bird. It is very rare now but has been seen on the island of Eua. Its eye has a beautiful red iris. The expression is [826] used of a handsome face.

179. Hange ha tavake ta mafua: Like a tropic bird striking its prey.

Graceful action is here likened to the beautiful sweep of the bird's flight as it comes down to the surface of the sea, the attractiveness of its appearance being further enhanced by its striking tail feathers. (Compare No. 36.)

180. Holo ae miji ki he ovava: The *miji* flock to the *ovava* 539 *(Ficus prolixa)*. 824

The *miji* (*Aplonis tabuensis*) likes the little berries of the *ovava* tree. 825 and flies to the *ovava* in preference to any other tree. The *ovava*, more- [137] over, is a large noble tree and the bird may be supposed to be attracted [136] by its distinguished appearance.. The application is that people like to flock [571] to the home of a chief or of a wealthy man. [554]

[622]

[556]

227. **Mala nima:** Bad luck (of the) hand. 539

Bad luck, or curse, that is not a visitation of the unseen powers but 226
arises from the awakwardness or folly of man. The phrase is said to 777
have had its origin in the bonito fishing of a certain Tamanika of Fotuhaa in Haapai. He went on board a boat and had the task of bailing out. The fish bit well but the man in charge of the lines continually failed to land a catch. Tamanika vented his disgust in exclamations of, "*Isa, mala nima,*" "Ugh, bad luck from the hand." At length Tamanika was given the fisherman's post and a wonderful haul resulted. It is said that the reef called Hakau Tabu was given to Tamanika in recognition of his expertness.

228. **Mavae a pa keina:** Separation of an eaten hook, that is, a 539
hook that attracts the fish and often gets a bite. 226

This is applied, for example, to a handsome man and a handsome 586
woman who have been married, but afterwards separated. Each one of them is a hook that is very likely soon to catch another fish.

229. **Ngofua e fanga kae taumatu:** The beach is free, get the 539
matu. 226

A beach near which lived a great chief could not be fished on at will 622
by the common people. The Samoan *matu (Carsio pisong)* is a fish which 423
is found inshore, and therefore cannot be caught by the common people [136]
near where a chief is living except when the lord's beach is open to the public. Such removal of restriction is indicated by the phrase; the beach is
open and even the *matu* may be caught. Used generally of being permitted [784]
to do that which was prohibited.

230. **Oku kei mata ae tua niu:** The rib of the coconut leaflet is 539
still green. 226

Indicates primarily a fishing net in which the leaflets of the coconut 824
are strung on a rope. This net is used more than once; it may be used as long as the leaves remain in good condition. Applied directly to fishing it means that there is still opportunity for the sport as the net is not yet past service. Generally it means that there is still time, or opportunity, for something.

231. **Pa kuo fau:** Fish hook that has been made, that is, skill- 539
fully made by a real craftsman. 226

Thence generally to that which has the marks of real craftsmanship about it.

232. **Taki taha uku ene fonu:** Each one dive for his own turtle. 539

This is commonly used of everybody attending to his own interests. 225
The pursuit of the turtle is a difficult sport calling for considerable ex- 571
perience and skill. It is a sport moreover whose fruits must be properly 622

sea. These brothers were chiefs, each with his own followers, and the angry 539
man's followers went with their master over the cliff. Among them was a 571
Samoan. The party were turned into porpoises, and the tattooing on the 825
Samoan's body is the origin of the marking on the belly of the porpoise.

314. Feofaaki a kakau: Mutual affection of swimmers. 539

Kindly feelings for each other felt by those who have very little oppor- 571
tunity of translating their sentiments into actions, just as men swimming 481
away from a wrecked boat can do very little for each other however much they may desire to.

315. Ha ha mo lofia: Appearing, appearing and awash. 539

Used of that which shows up and disappears at intervals, like an 823
object floating in the sea, which is visible for an instant and then is hidden from sight by the waves.

316. Hange ha pa utu: Like a steep cliff.

Used of that which stands firm and unshaken no matter what storms of trial beat against it. The picture is that of a great cliff unmoved by the dashing waves.

317. Hange ha tahi hua: Like an incoming tide.

A resistless thing.

318. Matemate a liku: The *liku* still.

The *liku* is the weather side of the island, usually protected by a broad shelf of rock, and always presenting a rock-bound inhospitable coast. Even when the tide is out and the sea smooth, leaving the shelf of reef dry and bare, one cannot altogether trust appearances for a sudden wave may come up and perhaps overwhelm those who are exposed in dangerous places on the rocks. Appearances that cannot be trusted. [183]

319. Laku maka fai ki tahi (or moana): Casting stones into the sea (or ocean).

A type of a useless labor; the stones are lost but the sea is not dammed up.

320. Likuliku mo ao: Windward and leeward.

The sea breaks heavily on the weather side but there is calm on the leeward side. This mixture of rough and calm is used proverbially of one [157]
whose character displays like inconsistencies; at one time he seems an honest man, and at another a liar; at one time kindly, and at another harsh.

321. Limu tuu i au: Seaweed standing in current. 539

That which is unstable, like seaweed constantly moved by the water. 824

which were hauled up from the depths of the sea many of the Tongan 539
and other islands. Tonga-fuji-fonua lived in Manuka (Manu'a) in Samoa, 776
and when the Maui's boat touched there the youngest Maui, Kijikiji, 773
jumped ashore and met Tonga's wife, of whose person and heart he quickly made himself master. Tonga himself was away fishing at the time, and the woman confided to Kijikiji the secret of the right hook to select when they should make their request to him on his return. This hook was a rusty, unattractive object, and Tonga exclaimed when the Maui chose it, "Who has *tavatava i Manuka* for you?" An informant told Mr. Gifford that Tavatava was the name of the woman who betrayed the secret of the hooks to Kijikiji, but this appears a very doubtful derivation. We do not know the word in Tongan, though there are words which may contain the same root. Krämer states (Die Samoa-Inseln, II. Band, p. 423) that Tavatava is the name of a fish in Samoa, and quotes a song connected with the Tui Manu'a, in which this fish is mentioned (op. cit., I. Band, p. 422). Edward Tregear (Mangareva Dictionary) gives a word *tavatava* in Mangarevan meaning "clamorous and noisy in speaking; to speak shrilly or in a loud voice."

There is probably, however, some story or traditionary explanation connected with the phrase. In our ignorance of it mere guesses are futile.

368. Kuo hange kuo emo e Faifaimalie: It is as though Faifaimalie had licked it up.

Faifaimalie (Do gently, go slowly) was a goddess famous for her appetite. She especially distinguished herself during a visit to Pulotu. Not stopping at the food provided by her divine entertainers, she made a clean sweep of the baskets and other containers in which it was brought. Faifaimalie's lick, therefore, indicates a complete clearance.

369. Tala pouli a puko: The *puko* telling in the dark. 539

Baker renders this expression: "To backbite and be overheard by the 773
party." Among the present-day Tongans this phrase seems to be lost, at all 571
events with the meaning given by Baker. It has been also explained as 824
meaning to disobey, to be told to do a thing and not to do it—an interpretation connected with the story of the speaking *puko* tree, which grew in Pulotu. The legendary traveller, Longopoa, who had made a journey to Pulotu, encountered this wonderful tree, which not only spoke but which was able to supply food, drink, shelter and other mortal wants. When leaving, Longopoa took a branch of this tree, which the tree itself told him to plant on his return to Tonga before he greeted his friends. Had Longopoa done as he was told the *puko* trees in Tonga, all of which sprang from this branch, would have been speaking trees like their progenitor. But the traveller neglected the warning and went to see his friends before he planted the tree. The *puko* tree in Tonga, therefore, does not possess the power of speech. In this account of the meaning of the proverb the significance of the words "in the dark" is said to be that the *puko* in Pulotu was accosted by Longopoa, supplied his wants and gave him his instructions during the night.

539 This tree in Pulotu is called by the Tongans the *puko leo*, speaking
773 *puko*, and it is curious that a tree in Samoa which has an equivalent name
571 (*pu'a*) and which is apparently the same tree, is called *pu'angangana*,
824 speaking *pu'a*. (Krämer, Samoa-Inseln, II Band, p. 381.)

RELIGION

539 **370. E unua e tevolo:** The devil will be shifted.
776 Applied to one who is very hard to move. The idea is that it would
157 be easier to shift a devil than such a one, hard as devils are to move.
(Compare Nos. 358, 340 and 133.)

539 **371. Fahu ae tapu:** The prohibition is removed.
554 The word *fahu*, which is of great importance in the understanding of
565 the social organization, indicates broadly rights enjoyed by reason of super-
784 ior family rank. A tabu can be removed by one who has this superiority to
the one who imposed it, and *fahu* thus comes to be a technical word for the removal of tabu. As a question this phrase is used to rebuke one who has presumed to do that which he should not.

539 **372. Faka-momoa-tea:** White fowl fashion.
825 This seems to be the literal translation, taking *momoa* as the redupli-
787 cated form of *moa*, fowl. The white fowl is said to be an omen bird. There are two principal senses in which the word is used; first, ominous,
201 presaging evil; second, to weep for the living as though they were dead.

539 **373. Hange ko Hina:** Like Hina.
776 Hina was one of the most talked of goddesses, as Jinilau was one of
773 the most talked of gods. Both are represented as very beautiful. Should a discussion arise as to the identity of a goddess in a tale the story was likely to be finally credited to Hina. Similarly Jinilau would probably be
[829] hit on if the name of a male diety were in question. So to say that anyone is like Hina means that he is much talked of, or much abused.

539 **374. Hia i Fanakava:** Criminal in Fanakava.
778 Fanakava was the name of a very famous sanctuary in Mua, the chief
681 district of Tongatabu, and the home of the Tui Tonga and of other great lords. Up to the introduction of Christianity Fanakava afforded an inviolable sanctuary to all who gained it. The expression indicates a person guilty of some offense but secure from punishment.

539 **375. Ji e he tevolo:** The devil pushing.
776 Used sarcastically to one who is making a poor apology for his bad conduct, "H'm, the devil shoved you into it." This phrase, which is recent,
183 is said to have originated with a man who went visiting a lady he should not have visited, and who, when put on trial for his conduct, defended himself by saying that he went to the woman without knowing what he was doing and that he supposed the devil must have thrust him into the house.

8: Collocott & Havea / M, I-5 (no date) 1922
OU9 Tonga OU9

563. Mata ki vae: Face to foot, that is, one who is face from head to foot, whose whole body is skillful and alert. 539 701

Applied particularly to the warrior who is not only bold and able in the use of his weapons but is also fleet-footed and able to escape by flight when flight is necessary. Used generally of the man who is capable and active in every direction. 554 826

564. Ngungu tau: Sounding war. 539

Applied primarily to the beating of the native drum for war. There were different ways of beating for different occasions. The war beat evidently produced a very full clear note, and *ngungu tau* has come to mean the note of the drum when it is specially resonant. Such a sound is today regarded as an omen that somebody will die; possibly a reminiscence from the real war beat which was a call to death. Like No. 308 this is used proverbially of signs that something is going to happen. 721 534

565. Pona-tuu: The exact literal translation is uncertain. It is perhaps Standing death-blow. 539 726

The thing indicated is the last effort of a warrior who seeks to slay a foe in the instant of his own fall. A great champion (*toa*) was regularly accompanied by a companion (*hoa*, comrade, *hoa-tau*, comrade in war), who was himself a doughty warrior, the friend of the greater champion in peace and his close attendant in battle. In a struggle between two champions their respective companions assisted them by attacking their adversaries from behind, each champion thus having two enemies to attend to. Should it become manifest to one of the champions that he must be overcome he would strive with his last effort to strike backwards and kill his opponent's companion as he himself fell. This last backward stroke was the *pona-tuu*. Applied generally to the final, supreme effort. 572

566. Popoto faka-Tongatapu: Tongatabu reconciliation. 539

Tongatabu was a land of war, and it was difficult to know whether a reconciliation were genuine or deceptive. 728

567. Ta e ta kae tapa e tapa: The strikers strike and the reserves are in reserve. 539 726

It was the business of the reserves to shout and tell who were slain. The meaning of the phrase appears to be, everybody doing his own job, both those whose business is the actual fighting and those whose function it is to report the progress of the battle. 701

568. Ta e toa tuu e toa: A champion struck down, a champion standing.

This means that after one great warrior is slain another steps forth to oppose the foe. The word for warrior, *To'a*, differs from the word for the tree, *toa*, (*Casuarina equisetofolia*) only in having the glottal stop, and the phrase is sometimes given the meaning that after one casuarina tree is 137 824

539 cut down another grows up. In either case the reference is to the same
thing, the labors and struggles of one mighty man who has fallen are taken
726 up by another. This proverb appears in a couplet, "*Ta e tea tuu e toa,*
701 *Iloga he vale bea hola.*" "A champion has fallen, a champion stands, let
824 him who is unskilled flee."
[137]

569. Tala pea taki mai ha tau: Tell and bring an army.

539 Like number 536 a derisive retort to one who threatens to report
571 one's conduct. Tell and bring an army to back up your censure. What
difference is it going to make if you do tell so-and-so? Is there going to
be an army sent to punish me? The same idea is expressed also by *Tala
pea e fai ha tau:* Tell, and is there going to be a war?

539 **570. Tata langovaka:** Striking compensation, that is, fighting
721 again to compensate for a previous defeat.

571 One will use his utmost endeavors to make good the earlier defeat.
183 Used generally of putting forth one's full effort so as to compensate for a
previous failure.

539 **571. Tau kovi pea kovi hono toi:** Bad fighting and bad hiding.

725 A skillful leader may make good the deficiency in numbers of his
183 troops by a wise use of cover. This indicates a state of things that was bad
enough in the beginning and was not remedied by judicious management.

539 **572. Tofi-kulu:** Head splitting; a knock-out blow.

726 Used of a final, decisive stroke, an unanswerable argument. The word
194 *kulu*, head, is interesting as showing the initial *k* which has been replaced
in the ordinary form of the word by the glottal stop.

539 **573. Tulituli ta:** Chasing up (the) stroke.

726 An expression from warfare, indicating one who is pursuing a fleeing
foe and is just about within striking distance. Applied to one who is
461 putting forth all his effort to accomplish something which he is on the
183 point of bringing off.

539 **574. Vava faka-Vaipoa:** Rejoicing Vaipoa-like.

726 Vaipoa is a village in Vavau. The phrase is applied to joyful expectations that are not realized. The expression is said to have originated with
276 a great warrior named Mahina who lived in Vaipoa. It was customary to
554 hold a kava ceremony on the eve of battle, and during the ceremony the
braves would boast, or pledge themselves to valiant action. It was not unusual for a warrior to boast that he would kill the first foe that should be slain. This of course pledged him to rush foremost into the thick of the battle. Occasionally the chief of the army would give to the champion who pledged himself to such an undertaking the most important cup of kava, in this case the first, the chief's own. On one occasion Mahina with his fellows of Vaipoa was on a warlike expedition and at the kava preceding the battle Mahina pledged himself to slay the first of the enemy

805 three generations since this happened" or "It occurred when my father's father was a child."

A general word for long ago, ancient times, is *onoaho*, as *onoponi* is used for recent time, the present age. There are several expressions for remote antiquity, as, *Hau o Momo* (when Momo was king), *Hau o Tuitatui* (when Tuitatui was king), *Hau o Muni Matamahae* (when Muni of the Torn Eye was king), *Hau o Motuku Veevalu* (when Motuku Veevalu, literally Eight-legged, was king). There are of course other words meaning uncountable, long enduring, which may be used to express the same idea of remotest antiquity.

SEASONS AND MONTHS

The Tongan year is said to have begun at about the same time as the Christian year, though no satisfactory explanation is given. [171] Gill[11] states that the Mangaians begin their year about the middle of December, the point of departure being marked by the appearance of the Pleiades on the eastern horizon just after sunset. This or some similar astronomical phenomenon may possibly have determined the beginning of the Tongan year.

[821] The two broad divisions of the year, in one of which the days
[132] and nights are cooler than in the other, were recognized and used
805 to classify seasons. Close observation of the habits of plants and
824 of animals provided a basis for more exact division. The times
825 when certain trees cast their leaves, flowered, or bore fruit were
utilized in making the calendar, as were also the periods when par-
805 ticular fish appeared. The greatest importance attaches to the
244 various stages of the growth of the yam. A large part of the
nomenclature of the moons is based on seasonal changes observed in this plant.

805 The normal year consisted of twelve months, though some years had thirteen. The nomenclature is largely agricultural, but there seems no reason to doubt the statement that the names were applied to the moons. The months and the commonly received explanations of their names are as follows:

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[113] [11] Gill, W. W., Myths and songs from the South Pacific, p. 317. London, 1876.

12: Vason M-3 (1797-1801) 1810
OU9 Tonga OU9

000 We found, upon our return, that our friends in the vessel had not been idle, in our absence, they had actively amused themselves in fishing, and during the day, had caught seven sharks.

Proceeding forwards about four days, at noon, we came in sight of Savage Island, so called by Captain Cook, on account of the barbarous appearance and
171 behaviour of the natives. Having little wind, we
did not come near it till night; but, through the
313 dark, we discovered many of the natives with lights
416 in their hands, fishing. These lights, as I afterwards
824 found, when I came to Tongataboo, are a kind of torch, which they call Tomais, made from the bark of the cocoa-nut tree, which, every year, grows up with the young stem, as it rises from the old stock; and as the new stem increases, it separates from it, like the husk from the fruit.

These bark leaves, (if I may so term them) are of an aromatic unctuous nature, and rising from the tree, to the length of two or three feet, very well serve, when bound together, to supply the place of a torch. The inhabitants of the Southern Islands carry them by night, to the sea; as the light proves an excellent decoy to attract the fish, which they then easily catch with a small net.

000 As soon as we discovered the lights, the Captain ordered the ship-bell to be rung; immediately the lights vanished; but in a quarter of an hour they again appeared. If it had been day, we should

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often divert themselves, viz. shooting rats, I became, 175
after a time, almost as dextrous as the natives. To 224
provide for this sport, they take out the kernel of 565
the cocoa-nut, which being burned and chewed,
the servants are sent to strew it in places near the
road, in fences, and in hollow trees. Meanwhile [525]
the chiefs, with bows and arrows, take their station
near, and making a squeaking noise exactly like
the rats, these animals soon come out to feed upon
the nuts, when the chiefs, ranged in order each for
his turn, shoot at them for a wager; he that kills
the most, in the same number of shots, wins the
game.

They are a very active people, yet they often 175
spend whole days, when they have no particular 517
employment, in luxurious indolence. These days [461]
they generally close in dancing and singing; of [535]
which they are peculiarly fond. [533]

The chief will send round the district, and col- 175
lect together thirty, forty, or fifty young people of 535
both sexes, to dance with his attendants by the light [373]
of tomais, or torches, formed, as we before showed, [416]
from the unctuous bark of the cocoa-tree. [824]

These dances are very beautiful. Young women
of the most graceful figure and comely features as- [301]
semble on these occasions, their dark ringlets be- [824]
spangled with aromatic flowers of a peculiar whiteness, their necks and shoulders encircled with
wreaths of variegated flowers, tastefully strung to-

175 gether like beads, their graceful limbs covered only
535 with a thin drapery, and in some cases, only shaded
[301] with an entwined garland of gee-leaves.

[824] Their dances are very much diversified, and performed
with admirable grace and uniformity, by
companies of eighty or a hundred, who all move
together with the greatest exactness. I never saw
soldiers go through their evolutions with more
prompt regularity than these companies time the
diversified motions that compose their dances.

They seem in their element, when dancing: such
is the ease, pleasure, grace and activity which they
exhibit, in every intricate part of this favourite
amusement.

175 Their musick is not so pleasing. The principal
533 instrument is a kind of drum, formed out of a log
of wood, hollowed through with a long small aperture,
175 and laid lengthways upon two pieces of
534 wood. This is beaten whilst eight or ten bamboos,
of different lengths, with pieces of wood fastened
and bound to the end of them, are struck
against the barrel, and produce a sound according to
175 the length of the stick. Of these drums they have
533 two or three; which, with the bamboos and the
[534] singing, make a little rough concert. Their songs are
beautiful and melodious; partaking more of a lively
175 than a plantive air, but rather monotonous. These
535 dances are often performed in particular spots where
there are large trees. To these places the young

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services of the expert are called in. This fishing is planned 226
for the night of the full moon. Six or seven days before this [821]
time, the men of the village are called together by the expert.
Each man is asked to provide from ten to fifteen coconut-sheets. During the day of the full moon, the men drive a
row of stakes across the exit to a wide shallow bay. To
these stakes the *pola* are tied, two deep generally being
sufficient. As the full moon comes up the tide will be high. [821]
The expert and others with boats float about inside the netted
area catching the fish that jump into the boats. The
remainder of the fishermen stand round outside the nets.
Calico sheets are fastened to the tops of the *pola* and as the
frightened fish try to leap over the obstructions, they are
caught in these sheets. The people make as much noise as
possible to frighten the fish. At a given signal from the
expert, made when the tide is quite low, all the fishermen
jump inside the closed arc and catch as many fish as they
can. This type of fishing is carried out from November to [221]
March. Huge catches are often made. The occasion is [461]
looked upon as one of great fun. Young and old join in the
sport, making as much noise as they can and enjoying the
frantic excitement as the trapped fish struggle from grasping
hands.

Large quantities of herring are sometimes caught by a
similar use of coconut-leaf traps together with the addition
of a fish-poisoning substance. This fish-poisoning is the [824]
crushed leaves and stalks of a shrub known as *kavahaha*.
A circle of coconut *pola* is formed. At a signal from the
expert fisherman in charge, the mouth of this circle is closed
by men who beat the waters and drive the fish into the trap.
Women round the circle throw the poisoning inside. The fish
quickly become stupefied and are easily caught.

Hook and line fishing is carried on from canoes by one
or more men. Trolling from a canoe is often successful in [221]
the months from September to December. Flying-fish
netting is not a known method of fishing today. Some men
in Pangai know the techniques for bonito-fishing and the beds
off Vava'u where there is more likelihood of catching bonito [178]
from December to March. But bonito-fishing is no longer
carried out. One informant mentioned Niuafo'ou as the only
place today where old Tongan methods of catching bonito
were still in use.

when respect is due to a superior. The materials are 285
pandanus-leaves. The plaiting technique is typically Polynesian. [824)
The finest mats worn as *vala (ta'o vala fala)* are
very scarce in Pangai today. They are about eight feet by 285
six feet in size and plaited with twelve to fourteen elements 294
to the inch. Such mats take an ordinarily industrious woman [461)
from two to three years to complete. Few Pangai women
seem to have either the skill or the patience to make these [178)
mats today. They have therefore a great scarcity value.
They are worn only on Sundays, special festive occasions or 285
when meeting a superior. When not in use they are kept 292
in safe, secret places to avoid any possibility of theft.

Many of the fine mats worn today have been inherited. [428]
Thus one woman has inherited hers from her mother's
mother and expects in turn to pass it on to her own daughter.
Both men and women wear these fine mats fastened with a
length of braided or twisted sennit termed *ta'o vala kafa.* [283)
The sennit is worn round the waist on top of the mat. There
appears to be no single and specific technique for making
this sennit "belt." Each man makes his according to what
skill he has at his command.

As the fine mats become rarer still in the village, it is 292
likely that there will be developed some new material 178
through the use of which respect may be symbolized. 576
Possibly one of the finer and more expensive commercial
cloths will be adapted to this end and will become as
necessary an item of clothing as the fine mat is today.

EXPERTS

For most of the work activities of this Tongan village 463
no more expert knowledge is required than is possessed by
the average man or woman. He or she is capable of doing
the task that is required or of acting as leader of group-work.
Some types of work however, require the leadership and
direction of a recognized expert (generically, *tufunga*), one
who has special knowledge, acquired through training, of
the relatively complex techniques involved. In Pangai today
there are four recognized experts in the making of European-style houses, one expert in the building of Tongan houses;
one expert undertaker; four expert dug-out canoe makers;
two experts in the art of making the built-up plank-canoe;

that many types of sickness are due to ghostly visitants.[26] 753
To deal with these ghosts, Tongan methods are more likely 775
to bring about cures than the white man's science. The 757
following treatments were compiled for us by one of the 759
village medicine-men. They are given here, not as a complete survey of the village medical knowledge, but as indicating the sort of techniques that medicine men use in their day to day practice in the village.

Headache: There are two main types of treatment: 757
(a) Massage the head with a mixture of six *uhi* leaves 755
crushed and mixed with coconut-oil; observe also the following rules: (824)
keep the head covered, do not go out in the wind, keep away from the sun and the sea; (b) Stamp on the ground three times; then place the feet on a mat and stamp again. Repeat this procedure five times in succession. This [775]
treatment is advisable if it is thought that the headache is [753]
caused by a ghost. The ghost is likely to drop from the body with the repeated shaking.

Earache: If the earache appears to be caused by an 757
abscess or inflammation, massage the region of the ear gently (824)
with six *nonu* leaves. On the other hand, should there be no signs of external irritation, then dip the finger in coconut-oil and poke the oil deep into the ear.

Mouthache: Spread coconut-oil over the back of the mouth and palate, then rinse out the mouth three times with water.

Toothache: (a) Smear coconut-oil on the cheek in the 757
region of the aching tooth; (b) Place a small piece of Tongan 824
tobacco on the aching tooth; (c) Take scrapings from the bark of the *angoango* tree, strain them through the stipule of the coconut-tree and drink the liquid; (d) Collect twenty-four *takafulu* leaves, pound them and drink the resulting juice.

Sore eyes: Take six *hulala* leaves, pound them, then dip a piece of bark cloth into the liquid and squeeze out into the sore eye.

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[26] Notes on the conceptual basis of Tongan disease are given in a [113]
short paper by Collocott, "Sickness, Ghosts and Medicine in Tonga," *Journal of the Polynesian Society*, 32 (1923) 136-142.

757 824 *Stomach-ache:* (a) To the liquid from twelve pounded *nonu* leaves add three drops of coconut-oil, strain through coconut-stipule and drink with water; (b) Mix scrapings from the bark of the *mohokia* tree and of the *kea* breadfruit tree with water, and drink; (c) For a laxative, add water to the scraped bark of the *fa'efa'elunga* tree and drink; (d) Massage the abdomen with four leaves from the fig-tree.

Boils: (a) Crush bark scrapings from the *nonu* tree and smear on the inflamed area after mixing with crushed *koka* leaves; (b) For spots on a baby's skin, pound or chew the leaves of the *fekika* tree, mix with water. Dip coconut-stipule in this liquid and squeeze the liquid into the baby's mouth.

Coughs: Scrape the bark of the *toa* tree or the *tava* tree, add water to the scrapings and drink the liquid.

Cuts: (a) Take the husk of the immature green coco-
[752] nut, heat it until it is warm, then squeeze out drops of liquid from the husk over the cut; (b) Crush the bark of the *fale* tree or the leaves of the *tamatama* tree, dip a piece of bark cloth in this juice and squeeze over the cut.

752 *Broken bones:* Apply a splint made from a section of the sheath of the coconut-tree to the broken limb and bathe the fracture night and morning with hot water.

757 "*Body-breaks*": Whenever there is pain in the upper part of the body, in the chest, lungs or back for instance, this pain is attributed to an obscure internal "breakage" in the body. Treatment: Add two drops of coconut-oil to some hot water and massage the seat of the pain with this liquid. In addition, mix the scraped bark of the *lekileki* tree with water and drink night and morning immediately after the massage
[755] is finished. For a backache, standing on one foot several times each day is also recommended.

757 759 The remedies just given are the secret recipes of one medicine-man only. Other experts have their own variations on these fundamental techniques of herbal and massage-treatment. The sick person will consult the experts in succession until one or other provides the treatment that effects the cure. It is of considerable advantage to the expert to know the acts likely to have caused the sickness,

622 One of our excursions was to the colony of
643 flying-foxes at Hihifo, where I wished to renew
my acquaintance with old Ata, the hereditary
lord of the western district, who had not been
on cordial terms with the king since the royal
[103] marriage. His village lies upon the shores of
Maria Bay, so named by Tasman when he discovered
the island in 1643, and it is close to
Kanakubolu, where the temporal kings were
always crowned, and from which they take their
[824] title of Tui Kanakubolu. The ancient tree
under which they sat was overthrown (*absit
omen*) in a gale a few years ago, and the present
king caused pieces of the wood to be inlaid in
825 the throne of the royal chapel. But the feature
of the place is the flying-fox colony. Four or
five great *toa* trees stand in the village square,
and many thousands of these great fruit-eating
bats roost there in the sunshine, hanging head
downward like noisome fruit, crawling, scratching,
quarrelling, killing the foliage with their
droppings and poisoning the air with their reek.
At nightfall they set forth in long procession for
the banana plantations, levying toll on them as
far as Mua, fifteen miles distant, and returning to
[778] their perch before daybreak. In no sense are
[777] they sacred, and away from the colony they may

From my conversations with the Tongans I am not quite sure 794
where the votaries and the priests sat during consultation of a god, 209
but think that the people would sit round at a respectable distance on
the green sward in front of the temple, and the priests would sit
either just within or without the doorway. Descriptions seem to point
to some such arrangement as this, and it is rendered almost certain by
its thorough agreement with universal custom in the paying of a
ceremonial visit to an important chief. It is hardly necessary to add 195
that all references to the gods were couched in the most deferential
language, terms being employed which were applied to the Tui Tonga
and the Tamaha alone amongst mortals, though used now of the
constitutional king. Such words are naturally used to-day of the [178]
Deity in Christian worship.

Another common mark of deference in approaching a superior is 292
the wearing of a mat about the waist, girt on with a cinnet-rope belt.
This addition to the dress, called a *taovala*, is universally worn at the 576
fono, or assemblies where the people are gathered together to hear the
will of their chiefs, or of the government, or when approaching a
great chief, especially to ask a favour. It is also worn at funerals.
Undoubtedly it was worn by the people approaching one of the
ancient gods. A mark of still deeper humility is a wreath of the 301
leaves of the *ifi* (*Inocarpus edulis*, Tahitian chestnut) round the neck. 576
This badge of deference was used, for example, by supplicants suing
for their lives. To sit with the head bowed, and these leaves round [824]
the neck, was the strongest possible expression of humility and [516]
entreaty. Whether it were a common adjunct or not of worship I do
not know, but it would seem highly probable that it was employed at
all events on occasions of great stress. Mariner describes it as being
worn on a certain occasion in entering a temple, but in this instance
the wearers were pleading for their lives to a great chief.

Naturally the gods varied in power and influence. Some were 776
resorted to by the whole nation; others were the gods of powerful 794
chiefs and their tribes and clans, whilst others enjoyed a more limited
prestige, their devotees being the little group of allied households
which forms the usual social unit. There was nothing to prevent a 776
a man's setting up a tutelary deity of his own if he were so disposed.
The number of the gods, moreover, was liable to constant augumenta- 769
tion by the deification of the illustrious or well-beloved dead. A
notable instance is Fakailoatonga, a chief related to Finau, of Vavau.
In his life-time Fakailoatonga was a famous warrior, and subdued, or 769
at least over-ran, a large part of Tongatabu, "but he was a leper." 734
For long he was ignorant of the nature of his malady, and his friends
sedulously refrained from reference to it. But one day a companion [762]
told him the ghastly truth, and Fakailoatonga, in his disgust, buried
himself alive. After his death he was elevated to the goddage. In the 771

16: Collocott M-5 (no date) 1921 OU9 Tonga OU9

361 is a widely distributed Polynesian place name. As the capital of the
modern kingdom Nukualofa is of course the residence of the Tui
[103] Kanokupolu; but the connection between this chieftainship and
Nukualofa is of longer standing than merely since the establishment of
[644] Christianity. The ancient Nukualofa was much smaller than the
present town, which includes within its boundaries a number of family
groups who inhabited areas whose names and locations are still
known.

The sacred object of Taliai Tubou is a large black volcanic pebble,
778 roughly oval in shape, now in the possession of the Wesleyan College,
Nukualofa. This stone is called Tui Ahau, i.e., King of Ahau. Its
613 headquarters were probably Kolovai, the largest town in western
[778] Tongatabu, and the home of Ata, the head of the Haa Ngata (Tribe of
Ngata), to which the Tui Kanokupolu belongs. Ahio was originally
the head of this tribe, but his influence waned by a process similar to
that by which the Tui Tonga's prestige diminished.

Besides the Tui Ahau in Nukualofa there is lying on the ground
778 in Kolovai another stone of the same kind, which enjoys a sort of twin
sanctity, and is reputed to possess the power, rather unusual in a stone,
of bringing forth little pebbles. The natives who led me to see the
stone narrated this curious circumstance with perfect gravity, but
search failed to reveal any of the fruits of petrine propagation.

These stones are of a sort not found on the coral islands of the group, and were perhaps brought from one or other of the two volcanic mountains in Haapai, Tofua and Kao.

Bekebeka-a-Tama, a flying-fox god, belonging originally to Ula, a
776 *matabule* (minor chief, or rather, great gentleman-attendant of a chief)
825 of Ahau, a village near Kolovai, in western Tongatabu, but now
transferred to Ata of Kolovai. The actual god seems to be a purely
[787] mythical flying-fox, whose appearance is an omen of disaster to Ata.
Bekabeka-a-tama is distinguished from the rank and file of flying-foxes
(*beka*) by his white colour, but I know of no one who claims ever to
824 have seen him.* In Kolovai are several casuarina trees on which the
flying-foxes are protected by a *tabu*, and which are covered with the
825 rather noisome little creatures. One or two great chiefs, however,
784 have the right of shooting them on the prohibited trees. If one falls
from the trees to the ground it is free of the *tabu*, and may be picked
up and taken away. Rumour avers that the modern small boy's awe
of the *tabu* is not sufficient to deter him from trying the effect of a
825 surreptitious missile. Should the flying-foxes desert their trees Ata
must make *kava* for them and so entice them home again.
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* Ata has since told me that he has several times seen a white flying-fox, most recently within the last two or three years.

Fakafumaka, or Vakafuhu, is the god of the village of Kanokupolu, 643
already mentioned as giving his title to the Tui Kanokupolu. Formerly
there stood here a tree beneath which the installation of the Tui [776]
Kanokupolu took place. A piece of wood from this tree has been used
in the construction of the throne of the Tongan kings, being let in at 643
the back of the royal seat, a symbol of the tree which once stood at the 644
back of the Tui Kanokupolu during his installation ceremony. 824

The sacred animal of this god was a little shell-fish called the *fuhu*,
but there is an obscure statement that he appeared sometimes as a 776
man and sometimes as a rock. The appearance as a man is probably
his declaring himself through the priest, but the meaning of his being 825
a rock is not clear, though it is apparently closely connected with the [787]
fuhu. [793]

An old song is still extant describing the voyage of Faka-fumaka
and Tutula, accompanied by the goddess Fai or Fai-malie, to Bulotu. 776
Fai is the real heroine of the piece, and distinguished herself not only
by her coolness and good sense in the several difficulties and dangers 533
in which they were involved during the voyage, but also by her [192]
voracious appetite in Bulotu, whence arises a proverbial expression
meaning ~~to~~ lick the platter clean, which in Tongan is to "lick like
Fai." Tongans, however, have no cause to regret her greediness, for, 776
having swallowed a yam in Bulotu, she returned to Tonga and gave
birth to a root that has been the progenitor of all the yams in these [824]
islands.

Haele-feke, literally "the Octopus comes," or "Coming in the [825]
Octopus," is a god which appeared in the octopus (*feke*). He is also called
Tutula, already mentioned as the companion of Faimalie and Faka-fumaka in their journey to Bulotu. Haele-feke is the god of Motua-buaka (lit. Old Pig), an important *matabule* of the Tui Kanokupolu,
and of Kioa, the head of a younger branch of the same clan. The [262]
clans of Motua-buaka and Kioa, inhabiting a cluster of villages in the
western district of Tongatabu, refrained from eating the small octopus
which is a favourite delicacy of the majority of Tongans.

The octopus god used to appear ashore in a pool called Kanakana. 776
It is said that he changed into a lizard when travelling overland.
When an octopus appeared in this pool it was at once recognised as 825
the god, and the priestess immediately went and awaited him at the [823]
shrine, apparently a little raised platform, whither presently the people
resorted with bunches of coconuts and plaited coconut leaves and 776
earth. The priestess spoke as the octopus, and from words used by 793
an informant would seem to have imitated an octopus, presumably [825]
sprawling out in the manner of this ungainly creature. [787]

The people of this deity not only eschewed in their own diet the
flesh of the octopus, but they must not approach a place where he was 776
being eaten. If any transgressed the *tabu* he was afflicted with 784
[262]
[827]

776 complete baldness, which, however, could be cured by suitable
supplications. Should any of the octopus people find one of their gods
[784] dead they gave him decent and ceremonious burial in Teekiu, their
[827] head village. With this god was connected the large cowrie shell
(*bulo*), from whose movements auguries were read. The connection
[766] perhaps arises from the use of the shell in octopus-fishing, or both
[237] facts have a common origin. A cowrie-shell forms the centre of the
bait, which is furnished with artificial tentacles, and somewhat
[787] resembles an octopus. This on being lowered into the water is clasped
237 by the octopus, who is then hauled up and taken.

226 Fono-ki-tangata, the god of the chief Valu and his people in
Utulau, in the central part of Tongatabu. The "*fono*" is the food
776 served with *kava*, and "*fono ki tangata*" means to use human flesh in
276 this way. When the *kava* was presented to the god a human sacrifice
accompanied it.

782 Tui Fiji, literally king of Fiji, is the god of Haa-Vakatolo, whose
776 chief is Ahomee, a village near the eastern boundary of the western
part of Tongatabu. The sacred object of the Tui Fiji is the tree
776 called *fehi* (*vesi* in Fiji), whose hard wood was a favourite with the
makers of spears and canoes. This tree does not flourish in Tonga,
824 but there are some specimens at Haavakatolo, and it is asserted that
it is impossible to get it to grow elsewhere in the group. The *fehi*, or
vesi, flourishes in Fiji.

Tradition records that on one occasion as the Haavakatolo people
773 were about to fight a neighbouring folk Tui Fiji told them to place
between themselves and their enemies a large lump of the food
prepared by burying and fermenting certain fruits; in this case
plantain. The warriors then each ate a piece of this food. None who
had partaken of this sacramental meal was to turn aside to right or to
left, or to flee from the foe. Immunity from death or serious wound
lay in keeping straight ahead. With the dictates of caution thus
urging to bold frontal attack the braves of Haavakatolo scored a
signal victory.

Jiji and Fainga'a are two female divinities belonging to the
776 Falefa, a clan of great *matabules* attached to the Tui Tonga. An old
[773] story relates their unfortunate love for a handsome yellow-haired
Samoan named Bajikole ("Folk-Lore," Vol. XXVI.). Their sacred
776 creature is the heron (*motuku*), the dark-coloured heron being the
825 incarnation of Jiji, and the light-coloured of Fainga'a. In Tonga a
pair of herons flying together, one dark and the other light-coloured,
are called Jiji and Fainga'a. It is said that formerly a pair of herons
so differentiated was no uncommon sight, but it is rarely seen now.

776 Finau-tau-iku, a god whose habitat was in the eastern end of
Tongatabu, near the chief residence of the Tui Tonga. His priest
[779] was named Mohe-ke-fie-hua (Sleep to Jest?). He is spoken of as a

Sharks' teeth were a regular part of the furnishing of temples dedicated to shark deities. [237] 778

Tobukulu and Nafanua, the twin sisters mentioned above, daughters of Toki-langa-fonua and Hina, and the mothers of Hemoana and Tafakula. They were turned into two rocks to which prayers were made for good seasons and big hauls of fish. 776 [823] [782]

Hemoana, literally Sea-Wanderer, has already been noticed in the brief notes of the creation myth as one of the original gods. Another account regards him as the son of Tobukulu, born whilst his mother, with her twin sister, was swimming home to Eua after the incest with their father. Toki-langa-fonua had abandoned Eua in horror at the discovery of the close relationship that subsisted between himself and Hina, but the desire of the twins to see their father had added fresh blots to the family history. 773

Hemoana was abandoned in the sea by his mother as soon as he was born. He was wont to appear in the sea-snake (*tuku-hali*). [825]

Tafakula, literally Red-Edge, a female divinity, born soon after Hemoana as their mothers were swimming from Samoa to Eua. Tafakula's mother, Nafanua, refused to abandon her in the sea, although strongly urged by Tobukulu to do so, and took the child home with her to Eua. In process of time Hemoana came to Eua to visit his relatives there, and he and Tafakula added another to the family's record of unwitting incest, but the unholy succession was stopped by Tafakula's battering the fruit of this union to death with a stone. Offerings were brought to Tafakula, and intercession made, to ensure fruitful seasons, and protection against hurricane and drought. [776] [782]

The suggestion is made by an intelligent Tongan that the name may refer to the red horizon at dawn and sunset. She is the goddess of the light. The island of Eua is high and stands towards the sun-rising from Tongatabu. It would be the first to catch the ruddy glow of the sun as he rose, and would also reflect his last beams as he disappeared below the horizon. Red things are particularly associated with Tafakula, the red varieties of several objects being spoken of as hers. In Eua there is a mound about which are growing two sorts of coconuts, whose Tongan names mean the red nut and the white nut, which is still called the demesne of Tafakula. This mound is probably the site of a house sacred to her. 776 [821] 133 776 [822] [824] [778]

Hina, a goddess widely known throughout Polynesia. Although the body of lore concerning her is not uniform there are numerous and close parallels between the accounts of the various Polynesian peoples. She occurs in several distinct connections in Tongan tradition, each of them presenting points of similarity with accounts from other parts of Polynesia. It will be well to summarise these. 776 171

361 [351] enclosures are planted largely with useful trees, such as the bread-fruit, banana, cocoa-nut, orange, citron, shaddock, and a variety of shrubs whose [245] overhanging foliage effectually screens the pathways from the intense heat of the sun. Very little order is observed in placing the numerous houses within these enclosures. There are no regular [363] avenues or streets. In fact, a house is generally placed where it can obtain the greatest amount of shade from overhanging trees,—a matter certainly of considerable importance in a tropical climate. A casual visitor, therefore, can see but few dwellings even when he has entered within the *loto a*, or fence of the *abi ;* and, until he hunts them out amongst the abounding shrubbery, he wonders where the people live.

A Tonguese house suits the few necessities and 342 easy habits of the people, but has none of the comforts so essential to a higher type of civilization. With the exception of what may be called public buildings, and a few of the dwellings of the chiefs of highest rank, their dimensions are small, and they contain but two apartments. They are, however, constructed with an eye to neatness and great strength ; and when elaborately finished in the best native style, their interior appearance is by no means to be despised. The walls range from four 342 to eight feet in height, and are formed either of a 824 single or double fencing of reeds, which, when interlaced and bound by sinnet to the *tokotuus*, or stakes and posts, planted all round the eaves of the building, resembles very much strong basket-work. These walls are sometimes made more wind and weather tight by the addition of a lining of plaited cocoa-nut leaves ; but, at the best, they afford a

342 sorry resistance to strong winds or heavy rains.
[824] On the other hand, there is capital ventilation; and
[354] perhaps that is of greater importance in such a hot
climate, than even freedom from the more occasional
annoyances attendant upon stormy weather.
To compensate for the lowness of the walls, the
roof of a Tonguese house is carried to a considerable
height. The rafters are closely set, and are
[824] generally made of the outer wood of the cocoa-nut
tree, or of the bread-fruit tree, the latter of which
has much the appearance of cedar wood, and has a
very pleasing and beautiful effect when nicely
finished. The large beams, to which the rafters are
[335] attached, are laid along the grooved tops of high
and durable posts, which reach about half way up
the entire height of roof. The inner ridge pole is
[353] usually ornamented by a profusion of sinnet wrappings
of varied colours and geometrically interlaced.
The roof itself is covered with a thick thatch,
[824] made from the leaves of the sugar-cane or of the
bamboo, and is perfectly water-tight. A well-built
house will last a good many years; but the thatching
requires to be renewed, under the most favourable
circumstances, about once in five years. The
[352] floor is laid with a profusion of dried leaves, which
are in turn covered over with numbers of mats
[824] made from the cocoa-nut leaf, upon which again
the finer sitting and sleeping mats are placed. No
provision is made in the interior of either native
or European house for cooking conveniences. A
[354] separate building contains the kitchen requisites,
and the heat of the climate renders a fire-place in
the dwelling house unnecessary. What is wanting
in the architectural beauty of these houses is amply
remedied by the loveliness of the natural bowers,

nation; and, most likely, the use of them was known from time immemorial, although without the instructions of any such man as good Bishop Wilfrid, who, about the year of our Lord 678, first taught the peasantry of our own land, on the coast of Sussex, how to make and to use nets. 226

Tonguese nets are made either for throwing by hand, or for deep-sea fishing. The former are of about three fathoms in length, by one in width. The meshes are fine; and the small cordage of which they are made is spun from the bark of the *fau.* (*Paritium tiliaceum* and *tricuspis.*) Those for seine or deep-sea fishing, are made of greater lengths, and are sufficiently strong to take and retain sharks and turtle, however large and powerful. 226 286 [824]

There are certain seasons of the year when an excellent fish, called the *otule,* (*Scomber scomber,* of Linnæus,) resorts to the coasts in shoals. Immense quantities are then taken by hand nets. The nets are either thrown singly, or, what is more usual, by parties of three or four men. Standing at proper distances from each other, and in a somewhat crouching posture, at the edge of the water, they watch the approach of the fish. When sufficiently near, the men throw their nets, in succession, and with marvellous swiftness and precision, so that they just overlap each other, at the ends. In this manner, a circle is formed, from which the fish have few chances of escape. 226

In fishing with seine nets, the Tonguese are accustomed to take very heavy hauls. We have often watched the operation with deep interest. It is as follows:—A portion of the sea is selected where the depth is suitable, and where it gradually

226 shoals up to a sandbank or rock. At a distance of
about a mile from the shallow place, two *kalias*,
or other large canoes, meet, each of which carries a
number of nets that have been carefully joined
together. These nets are made of cordage plaited
[824] from cocoa-nut fibre, and the meshes are made
close enough to retain all but the very smallest
sorts of fish. They measure five or six fathoms
each in length, by about two in depth. The nets
on the two canoes are then joined, after which the
vessels are paddled toward the rendezvous, taking
a wide circular sweep, and carefully dropping the
net as they advance. Meantime, other two canoes
have been stationed on the sandbank or shoal, and
from each of these ropes have been carried out, so
as to form another vast circle, within which are
enclosed the advancing canoes and the seine net.
[824] These ropes have plaited cocoa-nut leaves attached
to them, closely set, and so contrived that, when
let down into the sea, they present a sufficient
barrier to the escape of the fish when pressed forward by the advancing seine net. To complete the
arrangement, there is suspended, between the two
stationary canoes, an immense and strong netting,
answering to the shape of the English trawling net.
Into this all the fish are ultimately driven, as the
circle, made by the advancing fishermen, becomes
more and more contracted. On one occasion, when
we purposely went to watch the operation, about
three thousand fish were thus enclosed at a single
haul, comprising one turtle, a few sharks, and an
endless variety of all sorts and sizes. It was a
strange and amusing employment to observe the
alarmed movements of such a mixed multitude of
the finny tribes; and equally so to hear and see a

crowd of people, some in canoes, and still more swimming 226
and wading in the water, making merry over
the captives, and spearing any of the larger fish
that seemed likely to escape, or were behaving with
unbecoming rudeness to any of their weaker companions
in tribulation. Amid much shouting, and
many pleasant jokes, the whole of the motley
fraternity were safely secured; and, being easily
obtained when the tide had ebbed away, they were
speedily distributed among the several owners of
the nets and canoes.

The true sperm whale, and other species of the 136
cetaceous mammals, are often observed in the neighbourhood
of the islands. Dolphins and porpoises [225]
abound; but they are not sought after by the people.
Sharks, however, are numerous, and these are caught 226
in considerable numbers by hooks, or, more commonly
still, by a simple bait, and a running noose.
In all great feasts, the presence of as many sharks 262
as can be obtained, is considered to be an indispensable 252
requisite. They are always cooked entire, [574]
whatever may be their size; and they are enclosed [285]
in a long basket made from the cocoa-nut leaf. [824]
The flesh of a young shark, when about four feet
long, is exceedingly good eating. One of the 226
largest of these monsters we ever saw, was caught 136
from the deck of the Mission ship "John Wesley,"
when at anchor in Vavau harbour. It measured
nearly eighteen feet in length; and, when opened,
was found to contain sixteen young sharks, just
about to be spawned. It was what is called a
ground shark, having double rows of upper and
lower teeth, each separate tooth being as sharp as
a lancet.

Turtle do not abound so plentifully in the Friendly 225 136

slightly pink farinaceous flesh. The best sorts 245
surpass the finest pear in excellency of flavour. [262]
These are eaten raw, or they may be baked, or [252]
stewed, according to fancy. The Chinese dwarf
banana, (*Musa coccinea*, or *M. Chinensis*,) was [137]
introduced only a few years since, and has already
been widely spread through the islands. The fruit
is of a very delicate flavour, and the stem of this
species not being more than four feet high, it is
much better able to endure the periodical gales
that level to the ground all the taller sorts. It has,
consequently, become a great favourite with the
people, and will, probably, supplant many of the
others entirely.

No use has yet been made, by the Tonguese, of 824
the stem of this tree, in the manufacture of cordage, [283]
as is the practice in Manilla and elsewhere. Its 824
leaves, however, serve for several useful purposes. 415
One leaf can be readily fashioned, in a few minutes,
into at least half-a-dozen drinking cups; while by
gently heating an entire leaf over a fire, through
which it is rendered at once pliable and tough,
wrappers can be made in which to bake fowls so as
to retain their gravy, or in which even fish-soup can
be cooked without any loss of the liquid. Indeed, we
have frequently seen a banana-leaf bag, containing
a gallon, or more, of cocoa-nut oil, that had been
carried safely therein for many miles. Portions of 824
the juicy stem of the tree are always brought, at 515
the conclusion of a meal, to be used by the guests,
instead of soap and water, in cleansing the fingers,
after these have performed the duties of knife and
fork. It does this very effectively, when well
shredded, by rubbing between the hands.

Among other edible fruits of Tonga may be 262 parent plant. The custard apple, (*Anona squamosa*,) 000 245 is somewhat rare, and so also is the Tamarind tree, of which there is a very fine specimen in the Mission garden at Nukualofa.

The *fekika* or Malayan apple, (*Eugenia Malaccensis*,) of which there are two species, red and white, is much thought of. The *vi*, however, is more esteemed by European settlers, as being the best substitute for the English or American apple. In the Friendly Islands it does not attain the large size described by Dr. Seemann as characteristic of this fruit in Fiji.* We have never seen it larger than an ordinary English apple. The *Tava*, a kind of plum, [137] (*Pometia pinnata*,) is said to have been brought to Tonga from the Fijis, and if so, it likewise has degenerated by the change; for, while in Fiji it attains the size of a pomegranate, it never exceeds that of a large pippin in Tonga. The fruit is slimy, and very insipid to European taste. The *Ifi*, (*Inocarpus edulis*,) produces a large species of chestnut, [262] which is seldom eaten by the people, except in times of scarcity. The leaves of this tree, when [824] strung together into the form of a necklace, are [301] worn by captives taken in war, or by any offenders, [571] when brought into the presence of their lordly superiors, to *hu*, or make submission and obeisance.

Several of the best varieties of sugar cane, 249 (*Saccharum officinarum*,) are cultivated, under the generic name of *To*. The soil and climate are highly favourable to the luxuriant growth of this valuable tropical product. But the natives have not, as yet, been taught the method of manufacturing sugar, and therefore they have had little

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* "Viti: an Account of a Government Mission to the Viti or Fiji Islands," p. 316. [113]

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244 guese. Among these may be reckoned the *kumala*, or sweet potato, (*Convolvulus batatas*,) and the *talo*, or *arum*, of botanists. Both are grown; but the former is considered to be a very vulgar substitute for the yam; while the latter requires such marshy land for its perfect success, that only a very few spots are found suitable for it in the Friendly group. 797 The common potato has been tried by the Missionaries, and thrives pretty well 137 in favourable situations. The potatoes, however, soon degenerate in size and flavour, so that a renewal of imported seed becomes necessary every second or third year. It would, no doubt, do better if cultivated only on the higher lands of Vavau, and in similar localities.

244 There are several species of the *ji*, (*Dracæna*,) and from one of these a large root is obtained, [263] which, when baked, yields a considerable quantity [262] of brown saccharine liquid, sometimes used in sweetening native puddings; while the stringy substance of the root itself is eaten, and resembles somewhat in taste the sweetness of stick cinnamon. [231] The leaves of the different sorts of *ji* afford capital fodder for goats, sheep, and cattle.

824 The arrowroot plant, (*Tacca pinnatifida*,) grows [244] wild, and is found in quantities sufficient to meet the wants of the people, without any special care being devoted to its cultivation. The chief use of the starch, obtained from it by the natives, is in the manufacture of their *gatu*, or cloth. [287] The various small stripes of *fetaaki*, or beaten bark, of which the cloth is made, are joined together by means of arrowroot paste. Any quantity, however, of the root could be raised with but little outlay or labour; and when a better method of scraping and

washing shall be adopted, than the one now followed, the article will be quite equal to any that is produced in the East or West Indies, and will command a ready market in our English colonies. 824

The *Cassava*, or tapioca plant, of South America, has been added to the starch-yielding products of the islands; but it is, as yet, very little known or appreciated.

The turmeric plant, (*Curcuma longa*,) grows wild. It is called *ega* by the natives, and the powder prepared from the root is used as a cosmetic. Infants, newly born, are besmeared with it, as well as the mothers; and the reason assigned is, that it strengthens the skin, and is a good preventive of catarrhal affections. Its use by the Tonguese is confined to these occasions, while in other islands of the Pacific, (such as Rotumah,) men, women, and children, are profusely powdered with it every day, much to the annoyance and discomfort of visitors. They cannot enter a dwelling, or come in contact, in any way, with the natives, without being marked and smothered in turn. 824 302 [751]

An inferior species of ginger is also indigenous; but being very deficient in pungency, it is but little valued. Varieties of the shrubby Chilie plant, and of the small East Indian pepper, (*Capsicum frutescens*, and *C. baccatum*,) are both plentiful. 137

Indian corn succeeds admirably. It is the nearest approach to the cereals of more temperate climes that will thrive at all in Tonguese soil. In the mean time it is very little thought of, by either natives or foreigners; but when its various uses, and modes of preparation, are understood, as in

quarter to which the eye may be turned, the land 245
appears clad with their graceful foliage, down even to within a few feet of the sea itself. Proximity to the ocean, and a sandy soil, appear rather to favour than to hinder the rapid and healthy growth of the tree. Some of the finest and tallest specimens are met with on the shores of the lowest islands. In such situations they attain an elevation of eighty and even ninety feet. Hence an approaching voyager discovers the tufted heads of these palms in the distance, long before the land itself, upon which they grow, becomes visible.

The natives reckon at least nine different kinds of cocoa-nut trees, for all of which they have distinctive names, such as, the *niu-kafa*, *niu-ui*, *niu-leka*, &c. All these are known and included under [114]
the generic name of *Niu;* so that Dr. Seemann appears to be in error when he says, that "the Fijians are the only people who in their barbarous state had a collective term for the great natural order of palms."[*]

In addition to the multifarious uses to which 439
every portion of this tree has been devoted, from 434
time immemorial,[†] the natives now derive from it [824]
a large revenue of wealth, by the manufacture and
exportation of cocoa-nut oil. Nothing of this kind 439
was done, of any importance, before the year 1846. 434
At that time the Missionaries adopted various mea- 797
sures calculated to encourage the manufacture of the article, and to facilitate its sale to resident foreign traders. They also explained the duty incumbent upon professed converts to the Christian faith, and especially upon all members of the church,

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[*] Dr. Seemann's "Viti," p. 367.

[†] Ellis's "Polynesia Researches," vol. i., pp. 50-59.

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177 by the pressure of newly felt, and increasing neces-
181 sities, arising from an extended intercourse with
461 foreigners. But in the mean time these native
464 prejudices must stand in the way of any scheme,
of commercial enterprise, involving the employ-
ment of many hands.

In concluding our brief enumeration of the prin-
313 cipal natural products of Tonga, it may be sufficient
to say, that all the best islands contain trees
which yield good timber for building purposes;
but, both in variety and quantity, the supply is
limited. The natives take no pains whatever to
[185] increase the stock of timber-yielding trees, in those
localities that are adapted to their habits. There
are, it is true, certain stringent regulations respect-
ing the felling of timber; but there is at the same
time an unnecessary and reckless waste of what
, 313 nature herself affords. The best and largest trees
824 are used in the construction of canoes. *Bobaos*,
the smallest class of paddling canoes, are always
396 cut out of single trees. *Tafaagas*, the beautiful
and swift canoes that are employed in fishing for
the bonito and albicore, and also the *hamatefuas*,
or sailing canoes having only a single hull and
large outrigger, are all built of planking, in the
same style as the large *kalias*. These two classes
of canoes, being required in considerable numbers,
involve a great waste of valuable wood, inasmuch
as only two, or, at most, three planks can be ob-
tained, from a single tree, by the native method
of cutting.

313 The *tamanu*; (*Calophyllum Burmanni*;) the
137 *milo*; (*Thespesia populnea*;) the *futu*; (*Barring-
tonia speciosa*;) the *mohemohe*; the *fetau*; and the
tavahi, are the trees from which good and durable

797 selves of medical Missionary skill: while, at the
177 same time, they have confessed to the general efficacy of the treatment received, by the entire abandonment of many of the quackeries of their own professional doctors.

756 These Tonguese doctors, or *kau faitoo*, were a
759 distinct class who confined the knowledge of their art to their own families, and thus made the employment, which was lucrative, hereditary. The
[755] practice they followed was a combination of sorcery,
[757] and superstitious ceremony, with the administration of herbal medicines, or the external application of medicated oils, or pounded leaves. Unquestion-
[824] ably, their knowledge of the medicinal properties of herbs was considerable; but, not unfrequently, fatal results ensued from their prescriptions. Sometimes, in heathen days, these occurred by design, and at all times their administration might be
757 accompanied by serious accident. For the sake of securing greater secrecy, the herbs are often gathered during the darkness of night. Hence cases have been known, in which a deadly poison has thus become mixed with the intended medicine, and the patient has been destroyed. For the relief of local pain, the natives are great believers in the soothing and curative powers of proper external manipulation and friction, as well as in a liberal depletion, by small gashes, made over the afflicted part, after the style of "cupping." In rheumatic
[191] affections, and pains of a kindred nature, the natives employ medicated embrocations, which, I believe, are similar to those mentioned by Dr. Seemann as in use among the Fijians.*

752 In setting limbs, a few of the Tonguese doctors

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* "Viti," by Dr. Seemann, p. 340.

539 cushion, of the mat on which the game is played. The picture is that of a player who is proud of his shot, which is in reality a fluke that owes its success to the cushion. So, generally, of pride or boasting in that which we really owe to extraneous and adventitious aid.

7. *Hau 'o Momo, Loau.* Kingship of Momo, Loau. The time of Momo, of Loau, and of other famous kings and chiefs of old, is used of that which is ancient.

8. *Hage ha foi fa-hina.* Like a light pandanus fruit.

9. *Hage ha fuhi fa hobo.* Like a bunch of mature pandanus.

10. *Hage ha mahina hobo.* Like a rising moon.

These three expressions are all used of that which is beautiful.

11. *Hage ha kai ha toki motu'a.* Like an eating by an old axe. The old axe makes a jagged, bad job of its work, and the expression indicates badly, inefficiently-done work.

[415] [824] 12. *Hage ha tau-si.* Like a *tau-si.* The *tau-si* is a small spout of *si (Dracaena)* leaves so arranged as to drain water into a receptacle placed to receive it. Figuratively the expression may be applied, for example, to blood pouring freely from a wound.

13. *Hage ha teletele-uli.* Like a *teletele-uli.* The *teletele-uli* is a fish about two feet long, with a sucker on the back of its head, wherewith it attaches itself underneath the shark. Frequently it darts forward and filches food the shark is just about to swallow. The expression is used of one who clings to, and makes himself a nuisance to, one bigger, or more important than himself.

14. *Hage koe hobo 'ae mahina 'i Muaba.* Like the moon-rise in Muaba. A woman of Muaba in Eua, which is high, went to Tongatabu, and was astonished to see that the moon rose there with the same beauty and brilliance as it did at home in Muaba, and expressed her surprise in this saying.

15. *Ka 'ikai magugu 'e he nifo.*	If the teeth do not crunch
'Ikai ke ma'u hono ifo.	Its flavour is not got.

To get and appreciate the flavour of hard food the teeth must do thoroughly their work of mastication. To get the full satisfaction of difficult tasks they must be taken in hand resolutely, and carried through with determination and energy.

16. *Kai mo tokaga.* Eat and be careful. Used generally of acting with care, caution.

17. *Kei mata ae tu'a niu.* The mid-rib of the coconut leaflet is still green, fresh. This expression means: "The King is still well." Two explanations have been given me; one that the mid-rib of the coconut-leaflet is that on which scented flowers are strung to make garlands for the King; and that he is still well so that fresh garlands are still being made for him. The other explanation refers the mid-rib to the comb made of these mid-ribs; the king is well, and combs are still being made for him.

18. *Keu inu mai ha hu'a Ha'ahao.* That I might drink a draught of Ha'ahao. Ha'ahao is a pool of beautiful sweet water in Felemea in Haapai. A Samoan god stole a pool from Eua, and spilt some of the water in Felemea, and some in Bukotala—both places in the island of Ha'ano in Haapai. The expression may be used to indicate the longing of an exhausted man.

those whose mothers are noble on the side of the Hau, Tu'i 276
Kanokupolu, and fathers are noble in the Tu'i Tonga family), 574
pea tapu moe Sina'e ki mu'a (Tafolo, and perhaps 537
Tamale), pea tapu moe Sina'e 'eiki, pea tapu moe Sina'e ki 195 576
mui (perhaps Tamale, or Manumua and Lomu), pea tapu 643
moe Tu'i Hoi, pea tapu mo (moe) Faoa Manafa. Koe ngata
e tala 'o Fanakava kae ata kae fai hano tala (The end of
the telling of Fanakava[8] and it is clear to make its speech).

Before the *kava* is distributed the presentations of 276
food and *kava* are taken outside the ring. Motu'apuaka will 574
probably order them to be taken for Lauaki, who will 576
superintend their distribution, either personally or by a
deputy. If there be a chief present whom it is desired to 276
honour, for example a visitor, Motu'apuaka may order that 574
these presentations be taken for his *matapule;* or Lauaki, 576 565
in making the actual distribution, will see that he gets a 554
large share. In such distributions the chiefs for whom portions
(inasi) are designed are not named, but their *matapule*, and the *matapule* express thanks for the gifts. Visiting chiefs thus honoured will be expected to provide a good reception when, later on, they are visited in their own homes.

It will be recalled that three men are seated at the 276
kava-bowl, one at either side, and one behind facing the 574
king. The man on the side, in a line with the *matapule* who is directing operations says, when the straining is finished, *Kuo ma'a 'ae kava ni,* This *kava* is clear. The *matapule* responds *Tokonaki 'o fakatau,* Make ready and deal out. Then the cups, which have been in making whilst the *kava* was being brewed are brought.[9]

Of the two men seated at the side of the bowl one "calls," that is, calls out as each cup is filled; and the other removes the little pieces of *kava* that adhere about the rim of the bowl, usually employing a small piece of coconut-leaf

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[8] Fanakava, so far as one can get information about it from living [778]
Tongans, is remembered mostly as a sanctuary. It is a very sacred part of the Tu'i Tonga's ground in Mu'a.

[9] Although cups of coconut-shell are used on lesser occasions the [415]
cups used at great ceremonies are of folded plantain leaf. The coco- [283]
nut-shell cups of Niua Fo'ou differ from those of other parts of the [824]
Tongan Group in having a hole near the edge through which is threaded a cord of twisted hibiscus fibre, to serve as a hanger.

276 is used. The straining for *kava toho* is *milo-lua*, double twist. To begin this the fibres for straining are picked up with one hand. For *kava faka-tefisi* the straining is *fakumui-fonua*, land's-end-manner, to begin which the fibres are picked up out of the bowl with two hands.

INSTALLATION OF A CHIEF.

565 The essence of the installation of a chief is the calling
622 him into his place in the *kava*-ring, to receive his cup
554 by his new title. As a concrete example I was told that
276 Ve'ehala was to be installed, and that at the *kava* ceremony
574 he would sit in the *toua* whilst the *kava* was being prepared, and that when all was ready Motu'apuaka would say, *Koena 'a Ve'ehala, koe nofoanga e ki he tokelau*, There Ve'ehala, the seat yonder to the north.

At the installation of Ahio in January, 1920, Ahio sat next to Kioa, a classificatory younger brother of Motu'apuaka, who was absent. The first cup was given to Ahio.

INSTALLATION OF TU'I KANOKUPOLU.

643 Until recent years the Tu'i Kanokupolu was installed
at a great *kava* ceremony in Hihifo, the old seat of this kingship. The Tu'i Kanokupolu has now become the constitutional ruler of the whole group, absorbing into himself both the titles of the Tu'i Tonga and the Tu'i Ha'a-takalaua, and the installation of the last two rulers has been at the
[137] modern capital Nuku'alofa. On the green, *mala'e*, in Hihifo,
[824] where the installation previously took place, stood three
[644] trees, a *koka*, with an *orava*, banyan, on either side. The
king sat with his back to the *koka*, and the banyans were
[824] called Motu'apuaka and Lauaki, the *matapule*. A piece of
[644] the ancient *koka* has been let into the back of the modern
throne.

[276] At the installation of the present Queen, in 1918, a
[574] coronation ceremony on the European model was followed
by a native installation with appropriate *kava* ceremony
[644] on the *mala'e* at Nuku'alofa. Before the installation of a
[565] Tu'i Kanokupolu it seems to have been the practice for the
[554] king-elect, Ata, and Ve'ehala to meet together that the
king might be instructed by these two chiefs in his duties as guardian of the country. After the *kava* ceremony he was taken to a place near the *mala'e* in Hihifo, and received

zeal of the queen's followers. The strainers (bunches of wild hibiscus 643
fibre) were provided by special groups whose prerogative it was, 644
and represented certain chiefly families. 276 574

During the ceremony three conventional speeches were delivered 644
by three chiefs belonging to the Tui Kanokubolu group, who each 537
before speaking slid forward without rising, with two little jerks, 565
returning in the same manner to his place when his speech was finished. [516]
These speeches followed traditionary forms, and were exhortations to the Tui Kanokubolu and the people to do their duty to the Tui Tonga chiefs. The first referred to shell-fishing, the second to the bonito fishing, and the third to the fruits of the soil.

An interesting feature of these ceremonies was a man belonging 644
to a family which is connected with Fiji, who was decked out like a 643
Fijian warrior. He preceded the royal procession to the ground by 784
about a hundred yards or so, crouching and running and looking 576
about like an outpost spying out the enemy. When the queen was [276]
seated he violated all tabus and rules of ordinary decency by taking [264]
up his station near her, passing freely behind or before her, smoking whilst standing or lounging close beside her, and finally, when the pig's liver which is customarily offered to the chief on such occasions was put before the queen, he broke off a piece on the point of his spear and ate it in her presence.

The sanctity of the great chiefs is well illustrated in an interesting 643
native manuscript which was made available to me by the kindness of 784
the Hon. W. Tungi and Mr. E. W. Gifford. In these notes the 192
special words applied to the highest chiefs, the Tamaha and the Tui Tonga, are called the *tobutabu* insignia, the most sacred insignia. Since the institution of monarchy on the European pattern the Tui Tonga words are applied to the reigning sovereign.

FISHING

Industries have their own tabus. I have been told that formerly 784
a woman must not step over the green shoot of a sprouting yam, 824
though this is not now regarded, and young women of the present 241 562
generation whom I have questioned know nothing of it. It was also 784
tabu for anyone to step over a fishing net whilst it was being made. 226

Presumably if men passed from one side to the other of the net the 784
fish would do the same. The various sweet-smelling flowers which 226 825
are used to adorn and scent the leaf-girdles which are always worn
on festival occasions by both men and women, but particularly by the 292 824
women, are protected by a tabu belonging to the range of sympathetic 784
magic. Flowers that have been used in the leaf-girdle must not be
burnt before they are quite dead and dried up. Should this tabu be
violated the tree from which the burnt blossoms were taken will
thereafter be useless for supplying flowers for the girdles, and any
blooms plucked from it will quickly fade. It is only the individual
tree which is affected, and flowers from other trees of the same
species will retain their scent and freshness as before.

Fishing, an important industry of the inhabitants of these tiny 226
islets, and one moreover subject to alternations of success and failure, 784
of calm tranquillity and boisterous hazard, from causes which it is
frequently difficult either to foresee or to explain, retains in large
measure its old safeguard of tabus. If a man be out fishing and
someone inquire of his wife where he is she must not tell. Better to
sacrifice the truth than her husband's luck. This tabu, however, is
now falling into disregard. The best known tabus are those concerning the bonito and the shark. The bonito whose origin, or at 226
the least first arrival in Tongan waters, has a supernatural connection 784
with the Tui Haangana, the chief of the island of Haano in Haapai 825 [622]
will not suffer himself to be caught off that island if the chief ventures outside his house whilst bonito are in the vicinity. A similar [622]
tabu keeps one of the chiefs of the eastern end of Tongatabu within
doors when the bonito appears. There is also a proper order for the
disposal of the first-fruits of the bonito fishing in Tongatabu before
the fish is available for the people at large.

Of no fishing is the ritual more exact and more flourishing today
than that attending the pursuit of the shark. The most perfect harmony, even of thought and sentiment, must prevail amongst the
fishermen and amongst their friends and relatives ashore. Discord [828]
or the hidden rancor of the heart is fatal to success. A young woman
relates that in her childhood, as a party of shark-fishers were setting
out, she cried to be taken with her father who was a member of the

It
probably occurs in the word for breath (*manava*), which again is 778
used of the womb, though apparently without strict anatomical precision. [826]
This same word is found in compounds meaning fear [827]
(*manava-jii* "little manava or breath," *manava-he* "wandering
manava"), and courage (*manava-lahi* "great manava"). Taking
this class of words together the primary significance of mana seems
to be living power or force, and the word for breath and womb perhaps
means the place or seat of this power or force.

OMENS

The occult forces of the universe frequently manifest themselves 787
as warnings to mankind, and hence arises one of the commonest uses [778]
of the word mana, namely an omen. Many of these omens are still
known and more or less believed in. A considerable number are 787
concerned with impending calamity to a chief. Usually of course 565
the portent would occur in a locality or in an object which had some
relation to the threatened lord. In the island of Uiha in Haapai is [823]
a spring which turned red as a warning of the approaching death of
the chiefs connected with that place. A rock in the western district [823]
of Tongatabu indicated in some way a similar catastrophe. The [824]
breaking off, in calm weather, of branches of the banyan tree is an
omen of the death of a great chief. The large tree in eastern Tongatabu [824]
under which Captain Cook addressed the natives fell down a [643]
few years ago, and this proved to be an omen of the death of the
late King George II, though His Majesty survived the tree by about
two years. The roaring of the sea on the wide flats skirting a good [823]
length of the shore of western Tongatabu is also the sign of the death
of a chief. At the time of the death of King George I there was an [821]
unusually protracted spell of rainy weather. This too was mana, [643]
though apparently not so much an omen of the king's approaching
end as a sympathetic disturbance of the supernatural powers accompanying
the passing of this truly great man. Some still affirm that [825]
this king's death was presaged by the approach of a great shoal of
fish to the coast of Tongatabu. At Kolovai, in western Tongatabu, 787
the village of the high chief Ata, are several casuarina trees where 565
the flying-foxes are protected by a tabu. These trees with their clus- 825

39: Gerstle & Raitt C,Q-4,5 (1952-1972) 1974 OU9 Tonga OU9

281 Tapa making, one of the traditional arts of Tonga, is widely practiced today. Step (1) involves stripping the paper mulberry tree (photo at top left: Milika Fatai, Kolomotu'a) to reach the inner bark. (2) Strips of the soft inner bark are then soaked and pounded to be stretched (photo at bottom left: Kilisitina Fihaki and Luseane Hafoka, 'Eua). The mellow tap-tap-tapping of mallets beating tapa is quite a common sound in villages. (3) Natural dyes are made of juice from the *koka, tongo* (mangrove), or *tuitui* (candlenut) tree. Below, ladies at Halamangaono in Vava'u twist a sleeve of *koka* bark shavings to extract the brownish dye, which drips into the bowl under it. 386 824

'Oku kei lahi 'aupito 'i Tonga 'a e koka'anga pea mo e ngaahi ngaue kehekehe fekau'aki mo ia. (1) Ko hono hae eni 'o e hiapo 'e Milika Fatai (ta 'i to'ohema ki 'olunga) mei Kolomotu'a. (2) Ko e tutu eni 'a Kilisitina Fihaki pea mo Luseane Hafoka (ta 'i to'ohema ki lalo) mei 'Eua. (3) Ko ha kau fine'eiki eni mei he kolo ko Halamangaono 'i Leimatu'a, Vava'u, 'oku fai 'enau taukoka (ta 'i lalo).

3

[p.23]

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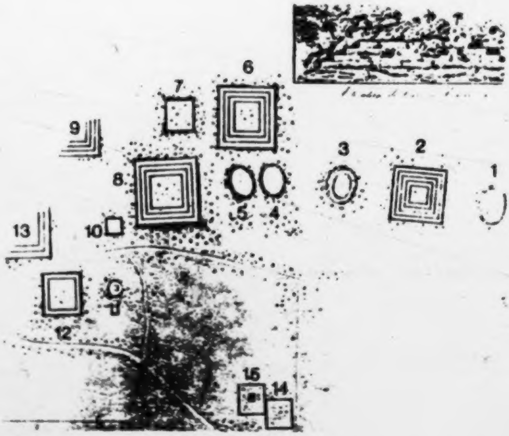

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766
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This plan of the "langi" at Mu'a was done in 1827 by an artist on Dumont d'Urville's voyage. The description, by number, as to who was believed at that time to be buried in each royal tomb, appears on page 95.

Ko e mape eni 'o e langi 'i Mu'a, 'a ia na'e fai 'i he 1827 'e ha tangata ta fakatata na'e folau ki Tonga pea mo e tangata folau 'iloa ko Dumont d'Urville. Ko e fakaikiiki 'o e ngaahi telio'anga 'oku ha ia 'i he peesi 96 .

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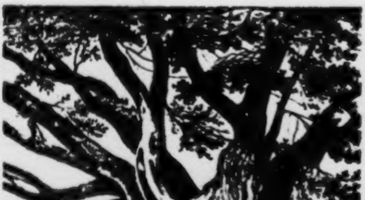

This colossal banyan tree, named *Malumalu'ofulilangi*, was the spot in Mu'a, according to oral tradition, where early Tongans landed to unload their tributes to the *Tu'i Tonga* for the annual *'Inasi* ceremony. It is also allegedly at the site where Cook came ashore in 1777, and has thus been called "Captain Cook's Tree." Measuring 100 feet in circumference when this sketch was made in 1827, the legendary tree perished not too many years ago, and has since been replaced by a smaller banyan tree.

Ko e ta fakatata eni 'o e fu'u 'ovava ko Malumalu'ofulilangi 'i Mu'a. 'Oku pehe foki ko e tu'uta'anga ia 'o e kau Tonga he kuo hili 'i he 'enau 'omi 'Inasi fakata'u ki he Tu'i Tonga. 'Oku 'i ai foki mo e tui na'e tu'uta heni 'a Kapiteni Kuki 'i he 1777, pea ui ai 'e he ni'ihi e fu'u 'akau ni ko e "Fu'u 'Ovava 'o Kapiteni Kuki." Na'e fai e ta fakatata ni he 1827, pea 'i he taimi ko ia na'e fe'unga mo e fute 'e 100 hono fua takatakai. Kuo 'osi mate foki e fu'u 'ovava ni, ka kuo 'osi to ai ha ki'i fu'u 'ovava si'isi'i ko hono fetongi.

276 *Kava,* which refers to the *piper methysticum* [824] plant or to the drink made from its root, was historically considered throughout Polynesia to be a gift from the gods to the human race.[24] Thus the ceremonial use of *kava* has always had religious [782] significance. Traditionally in Tonga, *kava* was frequently presented to the gods as an offering, or to a chief on every formal occasion; it was also imbibed in a solemn *kava* ritual at all ceremonies (e.g. weddings, funerals, appointments to offices, presentations of titles, etc.)[25]

[574] A formal *kava* ceremony in Tonga today, as of

[p. 46-B]

276

2

(2) Pounding the *kava* root, the first step (above) in the preparation of *kava* for drinking, is performed here by Tevita 'Ofa Helu. (3) After the crushed *kava* is placed in the *kava* bowl and water added (see next page), adept hands must wring and strain the *kava* mixture using hibiscus fiber *(fau)*. The *kava* is then ready to be served and drunk — currently from coconut half-shells, but in the past from cups skillfully made out of banana leaves.

[824]

[415]

[178]

(2) Ko hono tuki eni 'o e kava 'e Tevita 'Ofa Helu. (3) Ko hono tatau eni 'o e kava 'aki 'a e fau ('i he peesi hono hoko). Hili eni, pea inu leva 'a e hu'a kava 'aki e ngaahi ipu nge'esi niu. 'I he taimi fuoloa, na'e ngaue'aki e ngaahi ipu mei he lou'i siaine.

3

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824

(4) A small *kava* ceremony during the construction of the new Wesleyan Church at 'Ohonua, 'Eua in early 1974. (Photo below)

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(4) Ko ha faikava eni (ta 'i lalo) 'i 'Ohonua, 'Eua, lolotonga e langa 'o e falelotu Uesiliana fo'ou ai. Na'e fai e ta ni 'i he konga kimu'a 'o e 1974.

4

[p.48]

39: Gerstle & Raitt C.0-4,5 (1952-1972) 1974 OU9 Tonga OU9

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Medical service is free in Tonga. Modern medicine is thriving, and there are hospitals on all the main islands. Outreach clinics are also held periodically in villages, such as this photo (above) of a student nurse, Susitina 'Ofa, running a well-baby clinic in Kolomotu'a. Meanwhile, Tongan folk medicine is still practiced widely. In the photo at right, 'Ana Koka obtains scrapings from a *lepohina* branch (a variety of the castor-oil plant) to prepare a remedy for her sick son, 'Afa, in 'Ohonua, 'Eua. Liquid made from the inner bark is used for treating fever or inflammation, and it can also serve as a laxative.

[824]
[757]

'Oku ta'etotongi e faito'o kotoa ki he kakai Tonga. 'Oku fu'u menakoa 'aupito e faito'o fakapapalangi, 'o hange ko ia 'oku ha 'i he ta 'i 'olunga. Ko e ta'ahine neesi akoako ia ko Susitina 'Ofa 'i he fale sivi pepe 'i Kolomotu'a. Ka neongo ia, 'oku kei malohi 'aupito pe foki mo e faito'o fakatonga, 'o hange ko ia 'oku ha 'i he ta 'i to'omata'u. Ko 'Ana Koka ia 'oku ne vauvau ha va'a lepohina ke 'ai 'aki ha faito'o ma'a hono ki'i foha ko 'Afa. Ko e ongo me'a eni mei 'Ohonua, 'Eua.

824
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412

539 Bake it (for drinking) to keep my lover warm.
And I'll return to Pulotu."

[824] It was done as the eel had asked, and from his head the first coconut grew. If you husk a coconut and scrape it clean, you will see clearly the eyes and mouth of the eel. Thus, it was out of his deep love for Hina that the eel presented himself as a gift that would be useful forever to his lover and to the world.

[p. 26-A]

103
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643
ngahu plants that grew profusely there. They went on to the next island, and again she got sick. They went to a third island, and she liked it there so there they stayed until one night she woke up with stabbing pains in her back. Tupouto'a knew that she was in labour so they hurried and set sail for Lifuka. Before landing at Pangai, however, they decided to turn around and head for 'Uiha to Malupo's place so the child could be born there. As they passed Hihifo, Houma Fale Ono begged them to put to shore because she was going to give birth very soon.

[844] [824]
They landed on the beach just as she gave birth to a baby boy. The men called about for a ripe coconut to feed the baby.(12) Finally, an old man, who was bailing out the double canoe, called back that he had a nut from the last island they were on. This was brought and opened. They found that it was a nginingini "a dried shrivelled nut," for all the water was gone. The meat was still good, and they fed the baby with it. After this, they took the afterbirth and buried it further inland, marking the place with an ovava tree.(13) Then they sailed on to 'Uiha.

When they arrived at 'Uiha, a kava party was held and they told of their travels and the birth of the child. The first island on which they landed and where Houma Fale Ono vomitted from the smell of the ngahu plants was called /lua + ngahu/ "vomit ngahu." The next island was named /lua + hoko/ "vomit next" because that was where she threw up next. The third island that she liked, and where she woke up from her sleep with pain in her back, was called /ofo + langa/ "awake startled from sleep + pain." The beach on which the baby boy was delivered was called /niu ui/ "coconut call" because the men called around for a coconut to feed the baby. The child was named Nginingini Ofolanga, meaning "the shrivelled dried coconut from Ofolanga."

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Two more names associated with the war between Laufilitonga, the last Tu'i Tonga, and Taufa'ahau which took place on Lifuka island at Ha'apai(14) were given wrong meanings. They are:

Tauakipulu.	"To build two canoes at the same time for caulking with pulu gum (taua, to build two canoes at the same time; ki, for; pulu, a kind of gum, used as pitch for caulking canoes."(15)
Velata.	"To burn and to strike (vela, to burn; ta, to strike)."(16)

[713]
Gifford's Tauakipulu's correct spelling and pronunciation is /tau'akipulu/. It came from the terrifying yells of Laufili'tonga's fleeing warriors, /ko e pulu 'oku nau tau'aki/ "they are using gun powder in the fight." This sentence had been transformed into /tau'aki'a e pulu/ "fighting with gunpowder," or "using gunpowder for the fight," and /'a e/ got deleted resulting in the present form, /tau'akipulu/ the name given to the King's residence in Ha'apai to commemorate Taufa'ahau's victory over Laufilitonga's warriors.

Velata had also originated in a similar fashion to Tau'akipulu. It is the result of transformations of the original sentence /Ko e taa na'e vevela/" the strike that inflicted pain," referring figuratively to the great mental suffering of Laufilitonga when his wife Lupe Pau'u eloped with Taufa'ahau. This original sentence was transformed to /Na'e vevela 'a e taa/. Then the past tense marker /na'e/ was

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[853]
12. Before the baby is breast fed by the mother, he is given a *namoa*. This consists of ripe coconut meat which is chewed and wrapped in a piece of unpainted tapa cloth. Then this is placed in the baby's mouth so he can suck it. The coconut cream acts as a mild laxative and it cleans out the baby's *te 'evao* "bush excrement" which is the term applied to the baby's first passing of stool.
13. Most people in Ha'apai believe that the ovava tree in front of the hospital at Niu'ui on Lifuka is this same ovava tree referred to in this story.
14. Gifford. 1923:213–14.
15. */tau'akipulu/*. Gifford 1923:216. The three morphemes in this compound word are */tau/* "fight or war" /'aki/ instrumental suffix, and */pulu/* "gunpowder."
16. Gifford 1923:257.

11

went ashore again with a party of Marines and such of the Cattle as 122
were weak, I remained there till sunset when every thing be[ing] settled
to my satisfaction I returned on board leaving the Command on
shore to M^{r} King. Tapa who was now become our fast friend and 648
seemed to be the only active man about us, had a house brought on
Mens shoulders a full quarter of a mile and placed by the one we 565
occupied, in order to be near us as well in the night as day.[1] 482

SATURDAY *3rd*. Began to Water, cut wood, and make hay for the 122
catle. We at first began to cut wood abreast of the Ship it being there
in the greatest plenty and the most convenient to get on board, but [137]
it proved to be of the Mancheneel kind, yeilding a juice of a Milky
colour & of so corrosive a nature that it raised blisters on the Skin and
injured the eys of such of the workmen as it happened to fly upon;[2]
so that the wooding party were obliged to remove to the Cove where
wee took off Water and kept guard, where the natives furnished us
with other wood. M^{r} King and M^{r} Bailey began to observe equal [126]
altitudes of the sun in order to get the rate of the time keepers.[3] In the
evening before the natives retired from our post Tapah harangued 565
them for some time, we could only guess at the subject and judged he 537
was telling them how to behave to us, and encouraging them to
bring the produce of the island to market as a considerable quantity
was brought the next day.[4] 122

The Discoveries Small bower Cable parted, being cut in two by Sun. 4
the rocks, this occasioned us to look at ours which were found unhurt. Mon. 5

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[1] 'Omai is of great use to us, not only as an interpreter, but in keeping up a good understand^{g} between us & the Natives, for they pay him great attention & listen to the stories [123] he tells them about Britannee, which doubtless tends to keep up our consequence, too apt [177] to be lessen'd by the familiarity of our intercourse; & from which we find out that the Venereal disorder has been left among them; so it is, that wherever we go, we spread an [164] incurable distemper which nothing we can do can ever recompence.'—King.

[2] 'As our people were cutting wood they cut some Manganeel trees, the Sap of which flew into some of their Eyes which made them nearly blind for several days, their heads swelling very much but they all happily recovered their sight again as well as before.'—Bayly, 6 May. The machineel is a West Indian tree, with a caustic and poisonous milky [824] sap. Anderson got the name of the Tongan tree as 'faitanoo'—*feta'anu*. It was common to India, China and Malaysia as well as Polynesia, and Linnaeus had already named it *Excoecaria agallocha*—a tree growing up to about 36 feet, with smooth oval leaves, and the white, adhesive, irritating latex that damaged and alarmed the sailors.—'[A B]otanist might discover some differences, but to appearance any[on]e not so well skilled would certainly have no doubt of its being [manch]ineel.'—Bligh AL, I, p. 290.

[3] 'The 2^{d} Went on shore to look for a convenient place to observe in where I met Cap^{t} Cook who objected to my going on shore with my Inst^{s} on account of the insufficiency of the Guard. 3^{d} Received an invitation from Cap^{t} Cook to dine with him, when he proposed my going on Shore with my Astronom^{l} Quad^{t} only but not to carry my observatory, or at most to have only one between M^{r} King & me.—at last we settled it so as not to carry any observ^{y} on Shore but to pack up the Quad^{ts} every evening & deposit them in an Indian house that Cap^{t} Cook had hired for his people.'—Bayly T.

[4] 'another Chief of some consequence whose name is Kapee who frequently made long harangues to the People and kept them in good order, he was call'd by our People Lord North.'—Edgar, 2 May.

312 first were mostly in land and the latter by the shore of the Lagoon
and for the most part below high water mark, so that to have the
water tolerable it must be taken up at low water.

648 When we returned from our walk, which was not till the dusk of
the evening, our supper was ready, it consisted of a baked hog some
262 fish and yams all excellent well cooked after their own method. As
513 there was nothing to amuse us after supper we followed the Custom
of the Country and laid down to Sleep, our beds was a large piece of
Cloth spread on the floor. The King slept in the same house as well
521 as several others. Long before day break they rose and sat chating by
Moon light till it was day light; the conversation, as might well be
expected, turned wholy on us, the King entertaining the Company
Frid. 27 with an account of what he had seen. As soon as it was light they all
512 went away, some one way and some a nother, but it was not long
before they returned and with them several more. They now began
648 to make a bowl of Cava at which I left them to pay a Visit to Toobough
Captain Furneaux's friend, who had a house hard by, which
276 for size and neatness was exceeded by few in the place. As I had left
the others so I found here, a company preparing a Morning draught.
[431] This Chief made me a present of a living hog, a baked one, a quantity
of yams and a large piece of Cloth.

When I returned to the King I found the company drinking the
276 second bowl of Cava. When it was out the King told Omai he was
765 going to perform a Mourning ceremony for a Son which had been
dead some time and desired we would acompany him. We were
643 glad of the oppertunity expecting to see some thing new or Curious.
[292] The first thing the Chief did was to step out of the house, attended by
two Women, and put on a new sute of Cloathes, or piece of Cloth,
and over it an old ragged mat that might have served his great grand
Father on some such like occasion: his Servants or those who attended
him were all dressed in the same manner, excepting none of
[824] them having quite so ragged a Mat round them as their master.[1] Thus
equiped we marched off preceded by about eight or ten persons all
dressed in the same manner and with each a small green branch
about his neck. The King held his in his hand till we drew near the
place of rendezvouse when he tied it about his neck also. Thus we
entered a small inclosure, in which was a small neat house and one
[824] man seting before it. As they entered they pulled off the green
branch from round their necks and threw them away. After the King
was seated the others seated them selves in the usual way before him;

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[1] This was the *ta'ovala*, still worn as a sort of sash-apron; the raggedness was not for normal wear, but a sign of mourning.

[1777]

281 bark just as they are cleaned and beat them out as thin as they will bear without any regard to form. The Mallet is of the same shape as [412 that used at Otaheite, each side being three inches broad, one of which is smooth and the other three marked length ways with five or Six grooves, or furrows. I never saw a piece of cloth come from under the Mallet of more than two yards in length and a yard or a yard and a half wide, but more generally not a fourth part as big, to make larger pieces requires a different process. They have a large piece of wood made out of the trunk of [a] tree split in two, one side is made round and smooth and the other hollowed out; the round side is fifteen or eighteen inches over and the length of the log is equal to the broadest cloth the family it belongs to makes. On the round side of this log they fix platens, or patterns which are made of the leaves of the Wharra tree plated one into another, and stitched, or worked over with the fibres of Cocoanut husks by which the pattern is [381 formed so as to give an impression. Over these they spread very smooth the cloth, and bring it to the breadth they intend it by pasting [824 one piece to another with a fruit which they call , it is used when green, is something larger than a current berry and is an excellent gluten.[1] The work women hold a bunch of them between her teeth from which she plucks one when wanted. Over this first cloth is pasted a second and some times a third if the cloth is in- [386 tended to be thick, the last is a[l]ways the best. After all the holes, [824 if any, are repaired by pasting on patches, the whole is gently rubed over with a sort of varnish, or oily substance, which is expressed from the bark of a tree called by them .[2] At the same time this is laying on they press the Cloth with the hand so that it receives [386 the impression of the pattern. The varnish presently dries and is of a light brown Colour, if they want it darker, they mix with it, more or [824 less, of the soot that is produced by burning an oily nut the same as serves for Candles at Otaheite.[3] The first length being finished they remove it of the block and begin with another, thus they continue pasting one piece to another and working one length after another

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[1] 'The viscous juice of a berry called 'Tooo', says Anderson, with the note, 'This is the Cordia'. Tou in Tahiti and other islands is *Cordia subcordata*; but in Tonga, according to Churchward's dictionary, is *Melochia odorata* (the student who wishes to confuse himself may consult also Yuncker's *Plants of Tonga*). Churchward has a second definition, in which the parboiled fruit of *Melochia*, dipped in water, was formerly used as *tou* for pasting tapa—*tou* thus apparently being the paste. But Anderson and Cook must have seen the process.

[2] '. . . a juice extract'd from a tree call'd Kokka'—King. '. . . the soft bark of the *coca* tree and the *tooi-tooi* tree, either of which when wrung out, without water, yields a reddish brown juice, to be used as a die.'—Mariner, II, p. 204. Coca = Koka, *Bischofia javanica*; *tooi-tooi* = Tuitui, or candle-nut, *Aleurites moluccana* (the Tahitian *tutui*).

[3] That is, the candle-nut, from the bark of the tree of which came the original lighter brown.

till it is the length they intend it. The hollowed side of the log of wood is to receive the ends of the unworked cloth, so that they may be out of the way of the work women. They have of this cloth of different degrees of f[i]neness, according to the bark on which it is made; the finest is made of the Chinese paper Mulberry tree.[1] The Courser sort of which they make very large piec[e]s does not receive the impression of any platen, but is made on the log only.[2] Of the finer sort, they have some that is striped, chequered and other patterns of different colours, but how these Colours are laid on I can not say as I never saw any of this sort made.[3] All these sorts will resist water for some time and that which has the strongest glaze will resist it the longest. 287 [824]

The next considerable Manufacture is matting in which they exceed all the places I have been at both in texture and beauty. Many of those which are made of the bark of the Poerou[4] so far exceed those they have at Otaheite, that they are not a bad article to carry their by way of trade. They also excell in making baskets, some are exceedingly neat and they have of them of many different patterns. It is almost needless to say that they make ropes and lines of all sorts, Nets for fishing, fish-hooks and all manner of fishing geer with the greatest facility. But in what I think they most excell in point of workmanship, is in the building their Canoes, for an account of which and the manner of Navigating them I refer to the narrative of my last voyage.[5] 285 [824] 283 [226] 396

Masonry Masonry I have seen none but in the walls that inclose their Morais and their is nothing extraordinary in them but the size of the Stones, some of which are ten or twelve feet in length, four or five in breadth and one or more in thickness.[6] I examined several of these stones and found them composed of Coral sand and small Marine shells, and therefore concluded that they had been hewn from of the surface of the coral rocks. But even to do this with thier tools is no little work for before they got Iron they had only adze[s] of stone, a chissel of bone; a coral stone and sand and the Skin 333 [412] [237]

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[1] *Broussonetia papyrifera*, Tahitian Aute, Tongan Hiapo. The dyed cloth thus described is properly called *ngatu*, not *tapa* as in the other islands.

[2] It was made from the bark of the young breadfruit tree, Mei (Tahitian Uru). This plain cloth the Tongans called *tapa*; it was, says Mariner (II, p. 206), 'seldom worn, but is chiefly used for various purposes at funerals'. [824] [164]

[3] With a small stick used as a brush, as is still done.

[4] This was the Tahitian name, Purau, for the common *Hibiscus tiliaceus*. The Tongan name was Fau. [412]

[5] II, pp. 263–5, 447–8.

[6] Cook's misuse of the word 'morai' (*mala'e*) has already been noted. The reader interested in the remarkable structure of *fa'itoka* and *langi* can do no better than refer to the extended account in McKern's *Archaeology of Tonga*, pp. 30 ff.

648 in case any disturbance should happen with the natives, because she
lay quite abreast of the S^{o}most sandy beach whereas we were rather
609 to leeward of it. There was however little reason to expect such an
accident as they behav'd in the most civil manner to us (if we except
685 their attempting to thieve every thing) and many came off and
439 barterd hogs and Vegetables, though not in such numbers as when
standing off and on, as their attention was much taken up to day
with our boats going so frequently on shore.

132 **SATURDAY MAY 3d.** The wind N . Mod^{t} breezes. The weather fine
with some showers in the afternoon. Our people employ'd watering &
648 another party in cutting wood, both which the chief who is nam'd
Taipa agreed to. Many of the natives traded at the ship and on shore
439 exchanging their fruits for nails & beads as before. They also asisted
in rolling down our water casks but they seem'd to understand Trade
so perfectly that they would not do or give the smallest triffle unless
they were paid.

114 **SUNDAY 4th.** The wind W. Moderate breezes with fine weather. The
[432] people employed in wooding and watering and a party in cutting
grass for the Cattle. The indians continue to Barter their fruits but
[439] very few hogs are now brought, though several Canoes have come
[133] from the other islands. The Discovery lost her small bower anchor not
from any wind or sea but the foul ground which is probably coral
rock.

[132] **MONDAY MAY 5th.** The wind westerly. Gentle breezes with fine
137 weather. The people employ'd as before, but several of the party who
were wooding sufferd greatly from the juice of the trees which they
[114] cut down, as it is so acrid that when they wip'd their face with their
hands it inflam'd their Eyes so as to make them incapable of working
& had the same effect on some other parts. They erroneously suppos'd it to be Manchineel for it is a species of Pepper and grows
plentifully every where towards the shore. The trees are of no great
size & the twigs when broke distill a great quantity of a milky juice.
[824] It is calld Fait'anoo[1] by the natives & may easily be known by trying
if it has the milky juice or from its rounded leaves almost like a [2] tree.

114 The Discovery found her anchor again, but her misfortune made
us examine one of our Cables which we found unhurt. The Gunner
439 was employ'd as usual in bartering on shore for provisions & purchas'd a good many Yams and several hogs which came from some of
643 the other isles. We found that though Taipa or Kaipa was the person
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[1] Feta'anu, *Excoecaria agallocha*. It is common in Tonga in thickets near the sea.

[2] 'Manchineel' was presumably the word that slipped Anderson's pen.

dances, the prelude to which was a band of music or chorus of 18 609
men, who sat down in the centre of the place where the dances were 535
to be performd. Four or five of these had pieces of large Bamboo from 533
three to five or six feet long, with the close end of which the[y] kept
constantly beating the ground, though slowly, and they produc'd 534
sounds of different sorts according to their length, but all of the grave
or base cast, to counteract which a person kept striking a piece of the
same substance split and laid along the ground quickly with two
sticks, and by that means furnish'd a tone as acute as the first was
grave. The rest as well as those that beat with the Bamboos sung a 533
slow and soft air, which so temper'd the harsher music that a bye
stander who had been accustom'd to hear the most perfect and
various modulation of sounds could nevertheless not avoid confessing
the vast power and pleasing effect of this simple harmony, which
appear'd not to be produc'd from the variety but the sorts of tones
made use of.

After continuing for about a quarter of an hour twenty women [824]
enter'd the circle most of whom had garlands of the crimson flowers
of the China rose[1] or others about their head, and many had cut some [301]
other leaves they had about them as ornaments with a great deal of
nicety about the edges. They made a circle round the chorus turning 533
their faces towards it, and began by singing a soft air to which re-
sponses were made by the chorus in the same tone, which were 535
repeated alternately, during which time the woman accompanied
their song with several very gracefull motions of the hands towards the
face and in other directions, at the same time making constantly a
step forward and then back again with one foot while the other was
fix'd. They then turnd their faces to the assembly, sung some time,
and retreated slowly in a body to one part of the circle which was
opposite to where some of the principle people sat as spectators in a
small hut. One then advanc'd from each side, met and pass'd each
other at the front walking round till they came to the rest, on which
two advanc'd from each side two of whom pass'd each other and
return'd as the former, but the other two remaind & to these came
one from each side by intervals till they had again made a circle about
the chorus.

Their manner of dancing was now chang'd for a quicker sort in which they made a kind of half turn by leaping and clapp'd their hands, repeating some words in conjunction with the chorus, but towards the end as the quickness of the music increas'd they perform'd a sort of motion which with us would be rather reckon'd

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[1] Hibiscus.

the large end against a stone fix'd in the ground for that purpose, and 351
the other being push'd against the door serves as a strong bar, which 342
makes it as necessary to rap here at the door as at a gate in England
before you can enter an inclosure. In a great many of them there is a [417]
smaller inclosure within, this also often with a door, where the house
of the principal person is immediately plac'd, and near it or very
often in the outer one houses of an inferior sort for servants and
dependents. There are sometimes several little places again within [247]
this that have fences and houses, but communicate freely with each
other, and in most there is commonly a pretty spot of short grass,
though of no regular figure, before them with sweet smelling shrubs
call'd Ma'eele[1] and Hooe[2] planted up and down and some other trees
that produce beautifull flowers. The outer inclosure has commonly [245]
such things as they often want planted in them, as Cocoa nut trees
or some plantanes and bread fruit, but no considerable plantations of
Plantanes or Yams.

Beyond this a mile or two we generally found the Plantations more 311
extensive but open, and still farther on a great quantity of uncultivated
land coverd with grass as high as the Knee. Our guides said if
we advanc'd that way we should still find a waste uncultivated
country, or as they call it Váó,[3] but they probably did it only to save
themselves a little fatigue, for some miles beyond this the land seem'd
to rise a little higher and had a great many Cocoa trees, both signs of
its being cultivated. It could also be observ'd that even in this place
the soil was good, and it is probable many of the spots only lay fallow,
for we saw two or three large plantane fields that had lately been
broke in from such ground. It is remarkable that when on the highest 133
part, which is at least a hundred feet above the level of the sea, we
often found the same coral rock which is found at the shore, projecting
above the surface in the paths; and in many places where there
were large breaches with a small quantity of stinking water at the
bottom, it was always in the solid coral shatterd or seperated as it
were by violence.

At one place we fell in with a house where they were manufacturing 281
their cloth, which though extensive in itself is a very simple
operation. They take the slender stalks (or trunks) of the papper [248]
mulberry plant, which they cultivate for that purpose and seldom
grows more than six or seven feet in height or four fingers in thickness, [237]
from which they strip the bark and scrape off the outer rind with

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[1] Maile, *Alyxia stellata*, a shrub with fragrant long slender stems, abundant small leaves and dark red berries, much used for wreaths. [824]

[2] Hoi, *Dioscorea bulbifera*, one of the yams, with small flowers in spike-like clusters.

[3] *vao*, land in its natural uncultivated state. Anderson is very accurate.

281 248 291 a muscle shell. It is then roll'd up to take of the convexity which it had round the plant, tied and macerated in water for some time (they say a night), after which it is laid across the trunk of a small tree squar'd, and beaten with a square wooden instrument about a foot long, full of coarse grooves on all sides but sometimes with one plain. According to the size of the bark a piece is soon produc'd but the operation is often repeated by another hand, or it is folded several times and beat longer by the same, which seems rather to close than divide its texture. When it is sufficiently done it is spread out to dry, the pieces being from four or five feet to six or more in length and
824 381 half as broad. They are then given to another person who joins the pieces by smearing part of them over with the viscous juice of a Berry call'd 'Tooo,* which serves as a glue, till they become of a considerable size and are then laid over a large piece of wood with a kind of stamp made of a fibrous substance pretty closely interwoven
824 386 under it. They then take a bit of cloth and dip it in a juice which stands close by in a cocoa nut shell, express'd from the bark of a tree with the outer rind scrap'd off call'd Kokka,[1] and rub it briskly upon the cloth, which at once leaves a dull brown colour and a gloss for glazing & dryness upon its surface, the stamp at the same time making a slight impression that answers no other purpose which I could see than perhaps to make the several pieces that are glued together stick a little more firmly. In this manner they proceed joining and staining by degrees till they produce a piece of such length and breadth as they want, generally leaving a border of a
824 386 foot broad at the sides and longer at the ends unstaind. Through the whole, if any part of the original pieces are too thin or have holes, which is often the case, they glue spare bits upon them till it is of an equal thickness; and when they want to produce a black colour they mix the soot procur'd from an oily nut calld Dooe'dooe[2] with the juice of the Kokka in different quantitys as they want the tinge. They say that the black sort, which is commonly most glaz'd, makes a cold dress but the other a warm, and to obtain strength in both they are always carefull to join the small pieces length-ways which makes it impossible to tear the cloth in any direction but one.

312 As we wanted much to know if there was any good water about the bay our guides said they would conduct us to such a place and carried us to two different spots from whence the tide had fallen some way,

* This is the Cordia. [The Tahitian Tou is *Cordia subcordata*, but the Tongan tree of which the berries were used for this purpose was *Melochia aristata* or *M. odorata*. Cf. Cook, p. 172, n. 1 above.]

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[1] Koka, *Bischofia javanica*.

[2] Tuitui, *Aleurites moluccana*.

764 remarkable except a Fyatocka of one house standing on an artificial
mount at least thirty feet high. A little on one side there is a pretty
644 large open Area and not far from it a good deal of uncultivated
ground, which upon enquiring why it lay waste they seem'd to say
311 belong'd to that place which was Poulahos, and not by any means to
be touch'd. There was also at no great distance a number of E'toa
196 Trees on which clung millions of the large Ternate Bats[1] making a
disagreeable noise. We could not kill any at this time for want of
muskets, but some that were got at Anna'mooka measur'd near three
feet when the wings were extended.

On returning our host orderd the hog that had been dress'd to be
648 brought, with several baskets of bak'd yams and some Cocoa nuts,
574 but we found that instead of his entertaining us we were to entertain
264 him, the property of the feast being entirely transferr'd to us his
guests who were to dispose of it as we pleas'd. The person who cleand
[262] it in the morning cut it up (but not before we desird him) in a very
dexterous manner with a knife of split Bamboo, dividing the several
parts with such quickness and hit the joints so exactly that surpriz'd
us very much. The whole was set down before us, though at least fifty
pound weight, untill we took a small piece away and desir'd they
would share the rest amongst the people sitting round, but it was not
without a great many scruples they did that at last, and then ask'd
what particular people they should give it to. They were however
very well pleas'd when they found it not contrary to any custom of
ours, some carrying off the portion that was given them and others
eating it on the spot, but it was with great difficulty we could prevail
on Futtafaihe himself to eat a small bit.

After dinner we went with Futtafaihe and five or six people who
765 attended him to the same place where Poulaho had carried us in the
[114] morning the last time we were at Mooa, but not into the inclosure.
They hung some leaves about their neck in walking to it as he had
824 done, and when we came to a large open boat house where a few
people were they threw away their leaves, sat down before it and
[304] gave their cheeks a few gentle strokes with the fist, after which they
sat for about ten minutes with a very grave appearance & went away
[292] without having spoke a single word. Every person who went to this
house of mourning had a mat tied over the cloth they wore which
was also the case the day Poulaho went. This explaind what Poulaho
had mentiond about Tooge, though from the beating only lasting a
few seconds he had not been observ'd to do it; and this seems only a

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[1] *Pteropus tonganus*; Cf. Bayly, II, p. 263, n. 3. This was evidently the bat that the Tongans called *tauoetoa*.

[1777]

134 height, and when broken off appears sometimes of a reddish though
oftener of a brownish yellow colour & pretty stiff consistence. Where
[137 the shore is low the soil is commonly sandy or rather composd of
241] triturated coral, which however yields bushes with great luxuriance
and is sometimes planted not unsuccessfully by the natives.

Of cultivated fruits the principal are Plantanes of which they have
241 eighteen different sorts or varieties, Bread fruit, Jambos,[1] a sort of
245 plumb mention'd in Captⁿ Cooks account of Otaheite call'd E'eevee,[2]
and vast numbers of Shaddocks[3] which however are found as
often in a natural state as planted. The roots are yams, of which are
241 two sorts, one black & so large that they often weigh twenty and
244 thirty pound,[4] the other white and long seldom weighing a pound;[5] a
large root call'd Kappe,[6] one not unlike our white Potatoes call'd
Ma'whaha,[7] the Talo or Coccos[8] of other places and another nam'd
241 Jeejee.[9] Besides vast numbers of Cocoa nut trees they have three other
sorts of palms two of which are very scarce. One of them is call'd
245 Beeoo, which grows almost as high as the Cocoa tree, has very large
leaves plaited like a fan, and clusters or bunches of globular nuts not
larger than a small pistol ball growing amongst the branches with a
very hard kernel which is sometimes ate.[10] The other is a kind of
Cabbage tree not distinguishable from the Cocoa but by being rather
thicker and having its leaves more ragged. It has a Cabbage three or
four feet long, at the top of which are the leaves and at the bottom the
fruit, which is scarcely two inches long, resembling an oblong cocoa
nut with an insipid tenacious kernel call'd by the natives Neeoo
[764] goola or red cocoa nut, as it assumes a reddish cast when ripe.[11] The
third sort is calld Ongo ongo and much commoner, being generally
found planted about their burying places. It seldom grows higher
than five feet though sometimes to eight, and has a vast number of
oval compress'd nuts as large as a pippin sticking immediately to the
137 trunk amongst the leaves which are not ate.[12] There is plenty of
114 excellent sugar Cane which is cultivated, Gourds, Bamboo, Turmeric,
● 824 and a species of fig about the size of a small cherry calld Matte,
241 which though wild is sometimes ate;[13] but the Catalogue of uncultivated
244 plants is too large to be ennumerated here, especially as the

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[1] *Eugenia malaccensis.*
[2] Vi, *Spondias dulcis.*
[3] *Citrus decumana.*

[4] *Dioscorea alata*, though the tubers are generally brown on the outside rather than black. They sometimes grow to an enormous size, 6 to 8 feet long, and weigh much more than 30 lb.

[5] ? *Dioscorea bulbifera*, the wild yam.

[6] The Giant Taro, *Alocasia macrorrhyza.*

[7] Mahoa'a, *Tacca leontopetaloides.*

[8] Taro, *Colocasia antiquorum.*

[9] Si, *Cordyline terminalis.*

[10] Piu, *Pritchardia pacifica.*

[11] It was a sort of coconut: Niu kula, *Cocos nucifera* ssp.

[12] It is called Longo-longo by the modern Tongans: *Cycas circinalis.*

[13] Modern Masi, *Ficus tinctoria.*

55: Anderson D,T-5 (1777) 1967 OU9 Tonga OU9

unknown ones discoverd by Dʳ Forster who visited these islands in 197
1773 and 1774 are not yet wholly publish'd. Besides the Pemphis,[1]
Decaspermum,[2] Mallococca,[3] Maba[4] & some other new Genera 114
describ'd by that Gentleman in his Characteres Generum Plan- [824]
tarum, London 1776, there are a few more found here which the [241]
different perhaps season of the year and short stay did not suffer [249]
him to detect, although it did not appear during our stay that
above a fourth part of the trees and other plants were in flower, a
circumstance absolutely necessary to distinguish the various kinds
by.

The only Quadrupeds (besides hogs) are a few ratts,[5] and some 136
dogs which are not natives of the place but producd from some left by
Captⁿ Cook in 1773, and others got from an island call'd Feejee, [177]
which must also have been lately, as the breed is not yet so numerous
as to furnish the neighbouring isles with any. Fowls which are of a [235]
large breed are domesticated here.[6] Amongst the Birds are Parrots, somewhat smaller than the common grey ones, of an indifferent green on the back & wing, the tail blueish and the rest of a sooty or chocolate brown;[7] Parroquets not larger than a sparrow, of a fine yellowish green with bright azure on the crown of the head and the throat and belly red;[8] besides another sort as large as a dove, of a fine green with a blue crown & thighs, the throat & under part of the head crimson, as also part of the belly, and the rest a beautifull green.[9] There are owls about the size of our common sort but of finer plumage,[10] the Cuckoos mention'd at Palmerstons island,[11] King fishers about the size of a thrush of a greenish blue with a white ring about the neck;[12] and a bird of the thrush kind, almost as big, of a dull green colour with two yellow wattles at the base of the bill, which is the only singing one observ'd here but compensates a good deal for the want of others by the strength & melody of its notes which fill the woods at dawn, in the evening and at the breaking up of bad weather.[13] The other land birds are Rails as large as a pigeon of a variegated grey colour with a rusty neck,[14] a black sort with red eyes not larger than a lark,[15] large violet colour'd Coots with red bald crowns,[16] two

[1] Ngingie, *Pemphis acidula*.

[2] Nukonuko, *Decaspermum fruticosum*.

[3] Fo'ui, Forster's *Malococca crenata*, now *Grewia crenata*.

[4] Mapa, Forster's *Maba elliptica*, now *Diospyros ellipticifolia*.

[5] *Rattus exulans*.

[6] The common Indonesian and Pacific *Gallus bankiva*.

[7] Tongan Parrot, *Pyrrhulopsis tabuensis*.

[8] Blue-crested Parakeet, *Coriphilus fringillaceus*.

[9] *Coriphilus solitarius*.

[10] *Strix delicatula*.

[11] *Eudynamis taitensis*.

[12] White-collared Kingfisher, *Halcyon chloris*.

[13] Wattled Honey-eater, *Foulehaio carunculata*.

[14] Banded Rail, *Rallus philippensis*.

[15] Spotless Crake or Sooty Rail, *Porzana tabuensis*.

[16] Swamp Hen, *Porphyrio melanotus*

other virtues which our short stay with them might prevent us dis- 609
covering, whereas the only crime we know they have a propensity to 685
is theft to which all sexes and ages are addicted in an uncommon
degree. It should however be consider'd that this blemish to their [157]
reputation is merely with respect to us, for amongst themselves stealing is a crime not at all more common if so frequent as in other countrys, though it is doubtless sometimes practic'd. In other places
the motives to such a transgression are commonly Avarice, Indolence 685
or absolute want, but here it seems to arise solely from an intense 674
curiosity or desire to posess something which they see belongs to a sort of people so different from themselves, that if it were possible a set of beings seemingly as superior in our judgment should appear amongst us, I doubt much whether our natural regard to justice would be able to restrain many from falling into the same error. That this is their true motive for such a practice appears from their stealing every thing indiscriminately at first before they are sensible it can be of the smallest utility, but I believe with us no person would risque his reputation or being punishd as the law requires without knowing this before hand, though at the same time I will not venture to say how far the curiosity that gives the first impulse with them may be exchang'd for another motive after a certain time. The circumstances, though certainly both disagreeable and troublesome to strangers, affords some information as to the quickness of their intellects in devising a method and their address in concealing what they steal, for their small thefts are commited with great dexterity and those of greater consequence with a plan or scheme suited to their importance. As an extraordinary instance of the last sort might be mention'd an attempt which they made to carry away one of the Discoverys anchors at mid-day when every body was at work about the decks. They had plac'd a Canoe under the Bow where it lay & had so far accomplish'd their purpose that it was actually unlash'd & lower'd down untill part of the fluke hookd about the chains & prevented its going farther.

The hair is in general straight, thick and strong though a few have 142
it bushy or frizzled. The natural colour I believe almost without
exception is black, but the greatest part of the men & some women 302
have it staind of a brown or purple colour and a few of an orange cast. [142]
The first is done by applying a sort of plaster of burnt coral mixd with
water and the second with the raspings of a reddish wood call'd [824]
[1] which is made up with water into a poultice and laid

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[1] ? Koka, *Bischofia javanica*: the bark would be used.

302 over the hair. The other I believe is done in the same manner with
turmeric root. They are so exceeding whimsical in their method of
824 wearing it that it is hard to tell which is most in vogue, though the
greatest number perhaps are those that have it cropt short. Others
302 have it cut off one side of the head while the other is long, some with
only a piece cut out as far as the crown or perhaps shav'd that far,
and others have it entirely cut off except a single lock which is left
commonly on one side, or it is suffer'd to grow its full length without
any of these mutilations. The women except a few wear it short, but
the long hair is such an ornament to the last as well as the men who
wear it so that it is surprizing the practice is not general. Those who
wear it in that manner take uncommon pains in having it comb'd,
each small parcel being carefully seperated from the rest, and I have
seen a woman whose business it commonly is take an hour and a half
302 to dress a mans hair in that manner. The men have their beards cut
237 short which is done with two thin shells, one of them with the edge
broke into small notches being plac'd under the hair that is to be cut
off, and the back of the other press'd & drawn along the intercepted
part cuts it off very short. Both men & women have the arm pits
bar'd in the same manner, but when they cut their hair or shave it
304 very close the operation is perform'd with a sharks tooth. The men
are staind from about the middle of the belly to about half way down
[237] the thighs with a deep blue colour. This is done by what we might
[412] call puncturation or ingraining with a little flat bone instrument cut
full of fine teeth & fix'd in a handle. It is dipt into the staining mix-
[824] ture, which is prepard from the soot of the Dooedooe and struck into
the skin with a bit of stick untill the blood sometimes follows, and by
that means leaves such indelible marks that time cannot efface them.
They trace in this manner the various lines & figures that fancy
suggests which in some are very elegant either from their variety or
disposition, but as the practice is quite universal it does not appear
whether it is intended as an ornament, or merely a compliance with
one of those old customs for whose institution no satisfactory reason
can be given in after times. The women have none of this about their
bodys but often a few small lines or spots on the inside of their hands.
[751] The men are all circumcis'd or rather supercis'd, as the operation
consists in cutting off only a small piece of the foreskin at the upper
part, which by that means is render'd incapable ever after of
covering the glans, a circumstance which is all they aim at as they
[765] say it is practic'd merely from a notion of cleanliness. Besides the
marks remaining on the cheeks after performing the Tooge there are
great numbers who have concentric circles upon their arms call'd

Ko'ooma,[1] small black spots there and about the body call'd 304 ,[2] and in different parts longitudinal prominent scars nam'd Taffa,[3] none of which are ornamental but marks that show they 765 have mourn'd for their dead relations;[4] the two first of which are effected by fire, the other by incision, and seems to be done exactly in the same manner as those of the natives at Van Diemens land who probably do it on the same occasion.

Their common dress is a piece of cloth fasten'd about the middle 291 either by pushing the ends as they reach over within each other with a belt of the same cloth, or with a strong roundish plaited girdle [824] tapering at each end made from the Cocoa nut coir. It reaches to the ankle but sometimes scarcely so far, and they often leave as much above the fastening as will draw up & wrap round the body and shoulders when they find it necessary. The most usual next to that is [824] mats of various sorts fasten'd in the same manner, and over both are often tied a sort of sash made from the leaves of the Jeejee; but the [285] people of consequence are distinguish'd from the others by wearing their cloth plaited; and to make it a full dress, which is done on particular occasions as in their dances, Natche &c, they put over it a bit of matt only finish'd in the middle, with the long ends staind red. There is no distinction between the dress of the women and men and 301 their ornaments are also the same. The most common of these are [291] necklaces, made of the fruit of the Pandanus and various sweet smelling flowers which go under the general name of Ka'kulla,[5] others 301 made with small shells, the wing and leg bones of birds, sharks teeth & 291 other things all of which hang loose upon the breast. In the same [824] manner they often wear a mother of pearl shell neatly polishd, a ring of the same substance carv'd on the upper part of the arm, rings of tortoise shell on the fingers, and a number of these join'd together as bracelets on the wrists. The lobes of the ears (though most frequently only one) are perforated with two holes in which they wear [304] [302]

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[1] This is rather difficult: *ko uma* does not occur as a single word. *Uma* is shoulder; Anderson's informant probably gave him this word instead of that for a particular fashion of tattooing. 'Concentric circles on the arms and shoulders' was called 'Eetaee', says Labillardière, II, p. 405.

[2] 'Lafo', says Labillardière, ibid., 'Tattooing in the form of freakles on the face and part of the body'. Neither of these expressions for tattooing comes into any other word-list or dictionary I have seen.

[3] *tafa*, to cut in pieces, or generally to cut or lance.

[4] *none of which . . . relations*: Anderson seems to be quite wrong here. Signs of mourning might vary from singeing off the hair close to the scalp to quite savage self-infliction of wounds with clubs, stones, spears or knives; but tattooing does seem to have been purely ornamental. The 'longitudinal prominent scars', on the other hand, may have been those of mourning wounds.

[5] *kakala*, sweet-smelling flowers of any kind, or the trees and plants bearing them.

301 cylindrical bits of ivory[1] about three inches long, introduc'd at one
237 hole and brought out at the other, or bits of reed of the same size fill'd
with a yellow pigment which seems to be a fine powder of turmeric,
304 with which the women sometimes rub themselves all over in the same
302 manner that our ladys use their dry rouge upon the cheeks. Nothing
seems to give them greater pleasure than personal cleanliness, to
515 procure which they frequently bathe in the ponds which seem to
serve no other purpose. They prefer these to the sea, though most of
them stink intolerably, because the water is a little fresher and they
are so sensible that salt water hurts their skin that when necessity
obliges them to bathe in the sea they have commonly some Cocoa nut
302 shells of fresher water pourd over them to wash it off. They are
immoderately fond of Cocoa nut oil for the same reason, a great
quantity of which they not only pour upon their head and shoulders
but rub the body from head to foot briskly with a smaller quantity,
and (unless to those who have seen this practice) it is not easy to
conceive the different appearance and advantage they seem to
[565] receive from undergoing these different trimmings. This oil however
[296] is an article not to be procur'd by every one, and the inferior sort of
people doubtless appear less smooth for want of that and more
frequent shifting of their cloth, as it is no uncommon thing to see
them wash the last though its texture would at first make us think
that could not be done.

461 Their domestic life is of that middle kind which I believe the most
sensible part of mankind always desire, which is to say it is neither so
laborious as to be disagreeable nor so vacant as to suffer them to
degenerate into indolence. Nature has done so much for their
country that the first can hardly occur and their disposition seems to
be a pretty good bar to the last. This happy combination of circumstances
is such that their necessary labour seems to yield in its turn to
their recreations, in such a manner that the last are never interrupted
by the thoughts of being oblig'd to recur to the first till
462 satiety makes them wish for such a transition. The employment of the
women is of the easy kind and for the most part such as may be done
462 in the house. The manufacturing their cloth as already describ'd is
wholly consign'd to their care, and next to that fabricating their matts
285 seems to be of the greatest consequence. Of these they have seven or
eight different sorts for the purposes of wearing or sleeping on and
[824] many are merely ornamental. The last are chiefly made from the
[245] tough membranous part of the stock of the plantane tree, those they
[248] wear from the Pandanus, cultivated for that purpose and never

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[1] Whale tooth.

sufferd to shoot into a trunk, and the coarser sort which they sleep 462
upon from a plant call'd E'varra.[1] There are many other articles of
less note that employ their spare time, as combs of which they make 285
vast numbers, little baskets made of the same substance as the matts [824]
and others of the fibrous Cocoa nut husk, either plain or interwoven [245]
with small beads, but all made with such neatness and taste in the [248]
disposition of the different varietys, which are very numerous, that a
stranger cannot help looking with pleasure at their assiduity and
dexterity. Every person knows the beautifull character that Solomon 462
has drawn of an industrious women and the happy consequences
that attend it, and we may almost venture to say that Solomon in
that character has included a true picture of all the women of Tonga.
The province alloted to the men is as might be expected far more
laborious and extensive than that of the women. Agriculture, Architecture, [241]
Boat building, Fishing and other things that relate to Navigation [341]
are the objects of their care. I would not wish to refer to any [396]
thing prior to the date of this voyage to illustrate any circumstance
by, when I can avoid it, as it would be interweaving subjects that [226]
ought to be seperate unless every person knew them as well as myself, [502]
but I cannot help relating here an observation which may have been
made before, though not to my knowledge, which is that in all the 562
places I have visited in these seas the degree of civilization that has 171
taken place amongst them may be known by the attention they pay
to the fair sex. Those in a very barbarous state treat their women
with such a degree of rudeness or rather brutality and at the same
time indifference that they seem to think them not so much intended
as a companion, or to be upon the same scale with themselves, as a
set of beings every way inferior to them and only fit for such mean
offices as they would not stoop to. On the contrary as civilization has
advanc'd we find them not only eas'd of those laborious employments
which their natural delicacy of frame requires, but treated
with that respect to which they are often more justly entitled than
their lordly masters, and have even a great sway in the management
of affairs. Cultivated roots and fruits being their principal support 241
requires their constant attention to Agriculture, which they pursue
very diligently and seem to have brought to as much perfection
almost as circumstances will admitt of. The land about Mooa though 241
so well planted is scarcely equal to that part of the island where Cap^{t}
Cook anchor'd in 1773, and from Mooa to the NE point which is all 311
the places we have seen it is tolerable, from whence one might suppose,
if the unseen parts are in the same proportion, that two thirds

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[1] *fala* was the word for sleeping-mat, not for a plant. The pandanus was called *fa*.

349 Fyatockas have their sides made close in the same manner but are
perpendicular, & a few of the best belonging to the principal people
are also done in that way with some open spaces at different parts to
342 get in by. The only probable reason I can assign for their negligence
in Architecture is their fondness of living much in the open air, in so
much that they seem to consider their houses as of little use but to
sleep in and retire to in bad weather; and the lower sort of people who
spend a great part of their time in attending the others, being almost
constantly in their houses, can have no use for them but in the last
case.

501 They make amends for the former defect, if it can be truly
reckon'd one, by their attention to and great dexterity in Naval
Architecture, if I may be allow'd to give it that name. Their Canoes
are of two sorts, one of them us'd chiefly to fish in or go to any small
distance, the other to Navigate from isle to isle. The first are by far
the most numerous[1] and are commonly about five and twenty feet
long, near two over at the broadest part, and scarcely so deep. The
Bow is exactly like a wedge, from whence it turns gradually broader
towards the middle and tapers away till the after part, which droops
lower than the fore ends not unlike the tail of a fish. There is a deck
runs from forward to near a third of its length aft and another from
396 abaft forward but somewhat shorter. They are built of a tree call'd
[824] Toee,[2] the wood of which is variously colour'd and the pieces or
planks are so numerous, I know not whether from necessity or design,
that I have counted twenty six in one of a common size on one side.
Each plank is fitted with such nicety that they would do credit to an
expert Europæan artist, the only joining to be seen on the outside
being a line not more open than some in our common Cabinet work;
But on the inside there is a small ridge on the edge of each plank,
through which & the one next it holes are made by which they are
lash'd firmly with cord. The side of the Boat is rounded and every
part of the outside neatly polish'd, with little knobs on the two decks
501 where they fasten small white shells as ornaments. They carry from
three to five or even six people and are row'd with paddles of about
four feet long with an oval, pointed blade which sets them along at a
very quick rate. Their narrowness obliges them to use an outrigger or
they would be constantly oversetting. This is made by placing a pretty
thick spar about three feet from the boats side parallel to it, which is
fixt to two others that are laid across the boat from the opposite side,

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[1] This was the *tafa'anga*, 'among the most elegant of Pacific outriggers', says James Hornell, *Canoes of Oceania*, I (Honolulu, 1936), p. 259.

[2] Toi, *Alphitonia zizyphoides*.

by small sticks reaching from one to the other plac'd across or 501
obliquely for the greater security, and of such a length that the
parallel spar (which is about two thirds of the Boats length) lyes on
the surface of the water as she goes along. It is nevertheless, notwith- 502
standing this precaution, a very common accident for their Canoes to
turn quite over barely from changing the posture a few inches when
sitting in them, and that always to the side where the outrigger is not
fix'd. The same happens if the small sticks fastening the parallel to
the cross spars are broke, but these accidents are of little consequence, [481]
as all ages & sexes are such expert swimmers that they easily repair
the injury in the water by turning up the Canoe and baling her out or
fastening the sticks when displac'd. In these small embarkations they [824]
will venture several miles from the shore in a considerable sea and
wind and manage them very dexterously; but notwithstanding the [415]
nicety with which they are joind and though the seams are pitch'd
with a jetty substance smelling like amber that is said to be the juice
of a tree harden'd,[1] they are oblig'd to keep constantly baling out the
water, for which they use a scoop made exactly like those of our small
fishing boats.

The large or sailing Canoes[2] are shap'd not much unlike the others; 501
but both ends, which are drawn out to a point instead of a wedge, resemble each other. They are all double (i.e. two joind together) with the heighth of a pretty broad plank raisd upon the rounded part, from which rafters are laid across to lash the two together by, that are about four or five feet asunder. Over these is built a large platform or stage reaching from one deck to the other lengthways and projecting considerably beyond the outside of each. These are made of strong planks and are either flat or rise with a bending abaft like the deck of some ships. On this is plac'd a hut like half a cylinder resting on its inside, or of the figure of one of their common huts divided longitudinally, in which they keep their matts, cloth or other necessary things and where the principal people sleep in their Voyages. The mast is plac'd always in one of the Canoes before its middle and inclines to the opposite side and forwards, sometimes fix'd sometimes made to take out. It is well stay'd with strong ropes & has notches by which they go up occasionally, though it is but short in proportion to the vessel. The sail is of a triangular figure with the

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[1] A number of trees produced a gum used in caulking: I have not succeeded in finding out which particular one Anderson refers to here.

[2] Anderson here goes on to describe the *tongiaki*, double canoe, which just about this [177]
time was giving place to an improved version, the *kalia*, based on the design of the Fijian *ndrua*. We know from Webber's drawings that Cook saw both types. Hornell's discussion of these double canoes (op. cit., pp. 265–73) is both learned and interesting.

rains hard in the day they are guided by the swell of the sea & wind. 484
As another proof of the distance or at least of the stay they make at [502]
some places, they always carry a considerable quantity of Cloath, [821]
matts &c and provisions, the last of which they dress on a sort of [252]
hearth made of sand & stones plac'd near the fore part of the stage.
The number of people, amongst which are always several women,
being at least four times more than is sufficient to Navigate the Boat 505
implys some other business, though perhaps it may be for the relief of 461
each other: for here as in all other cases there seems to be such a
perfect unity amongst them that when they are oblig'd to paddle 533
from a calm or any other accident, the whole crew and rowers themselves
join in songs and a musical recitative to give an agreement to
their strokes and ease the irksomness of that unvaried labour.

The only tools they have to make these boats are Hatchets, or 412
rather thick Adzes, of the smooth black stone mentioned before (but
some want the projecting part behind), an augur made of a sharks 321
tooth fix'd on a small handle, and a rasp of a rough fishes skin laid 237
over & fastend on a flat piece of wood thinner on one side with a
handle. The vast labour they must be at and the time that is spent 396
with their [boats], being perhaps their most perfect mechanical
production, are probably the reasons for being so carefull of them, 348
for they are built and preserv'd under long shades of two sides which
reach to the ground & incline towards the top, so that the ends which
are both open represent a half ellipsis on its base; but when that
cannot be done they always cover the deck'd part with Cocoa leaves
after they are haul'd on shore to prevent the sun hurting them.

The same tools are all they have for other works, if we except 412
different shells which they use as knives, but there are few that [237]
require these unless it is some of their weapons, the other articles
being chiefly their fishing materials, cordage and a few others. The
Cordage is made from the fibres of the Cocoa nut husk, which though 283
not more than nine or ten inches long they plait about the size of a 824
quill or less to any length they please, & roll it up in balls from which
the larger rop[e]s are made by many of these being tied together and
twisted. The lines they fish with are made from the [1] 226
and are as strong and even as the best cord we make, resembling it [283]
almost in every respect. Their other things for that purpose are large
and small hooks, made with a pretty straight back and a point fix'd
on the inside near the end. The last are made entirely of pearl shell, [321]
but the first only coverd on the back with it, & the points of both [391]
commonly of tortoise shell, those of the small being plain the others

[1] Tou, not the *Melochia* but *Pipturus argenteus*, widely used for this purpose in the Pacific.

226 barb'd. With the large ones they catch Bonneto & Albicore by putting
[321] them to a large Bamboo rod twelve or fourteen feet long, with a
line as long, which rests in a notch of a piece of wood fix'd in the stern
[391] of the Canoe for that purpose, and is dragg'd on the surface as she
[227] rows along without any other bait than a tuft of flaxy stuff[1] near the
[824] point. They have also great numbers of pretty small seines, some of
which are of a very delicate texture, that they use to catch fish with
[462] in the holes on the reefs when the tide ebbs, besides barb'd gigs which
[502] they strike some with, each of which are so numerous that shows
much of their time is employ'd in that business; & it is the only thing
that can be reckon'd laborius where we find the women are sometimes
engag'd, and where they handle the paddle as dexterously as the
men.

534 The other manual employments consist chiefly in making musical
reeds, flutes, warlike weapons and stools or rather pillows[2] to sleep on.
[463] The reeds have eight, nine or ten pieces plac'd parallel to each other
but do not observe that simple progression in length as the ancient
,[3] having the longest sometimes in the middle &c and
several of the same length, so that I have seen none with more than
[533] six notes. They seem incapable of playing any regular music on these,
at least not distinguishable by our ears, though it seems very strange
they should invent an instrument whose powers they must certainly
be acquainted with and not be able to apply it to use, at least not
generally. The flutes are a joint of Bamboo close at both ends, with a
hole near each and four others, two of which & one of the first only
are us'd in playing.[4] They apply the Thumb of the left hand to close
the nostril of that side and blow into the hole at one end with the
other. The middle finger of the left hand is applied to the first hole
on that side and the fore finger of the right to the lowest of the same
side. In this manner though the notes are only three, they produce a
pleasing yet simple music which they vary much more than the notes
would seem to admit of. Whether the other holes have any use in this
case I am not certain, but one of their very evident intentions is to
serve as a double flute, for the other two holes & that at the end are
placd exactly in the same order as the others so that they play
533 indifferently with either end. Their being accustom'd to a music which
consists of such few notes is perhaps the reason why they do not seem
177 to relish any of ours, which is so complex, but they seem very sensible
of any that is more deficient than their own, as they us'd to be well

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[1] Teased out hibiscus bark would be so used.

[2] *kali*, pillows.

[3] Probably 'syrinx' was the word he was in search of. The Tongan name was *mimiha*.

[4] The *fangufangu*.

pleas'd with hearing the Heeva of our two young New Zeelanders 533
(from this change) which consists rather in mere strength than 177
melody of expression.

Their weapons are clubs & spears which cost them a good deal of 411
time & labour, the first being made of a solid piece of hard heavy
wood either black or brown, but chiefly that of the E'tȯȧ tree. They [824]
are of various shapes but that they seem fondest of, & which they
always us'd in their public diversions, is one shap'd like a lance at the [293]
blade but a good deal broader in the middle.[1] These are commonly [531]
plain, but a great number of the others which are somewhat quadrangular
(except the handle) and broadest at the point are entirely
carv'd in that part with lines, little triangles & other figures, sometimes
with great nicety, and they frequently venture to make likenesses
of Fish, Birds & men fighting but are poor imitators in that
respect. The spears are made likewise of a hard brown or black wood [237]
(though sometimes from the Cocoa tree) from five & six to twelve feet
long or more, generally simply pointed but sometimes beset all round
with the ragged bones of the stingrays tail for a foot at the point.
They also make bows and arrows, the first near six feet long, slender
and neatly made with a groove for the reception of the arrow on its
back part. The last are almost as long, being only a reed with a blunt
wooden point which they only use to shoot birds with, but what is a
little uncommon the bow is bent and drawn contrary to the direction
of its natural curve. The stools are about two feet long but only four 322
or five inches high and near four broad, bending downwards in the 531
middle with four strong legs & circular feet, the whole made of one
piece of black or brown wood neatly polishd & sometimes inlaid with 237
bits of ivory. They also inlay the handles of fly flaps with ivory[2] after
being neatly carv'd, and make small figures of men, birds and other
things from bone, which must be very difficult as their carving
instrument is only a Sharks tooth.

The floors of their houses are always coverd with a very coarse 352
kind of matt made from the Cocoa leaf as taken from the tree without 285
any preparation. They sit upon these cross legg'd, a posture they are [516]
so accustom'd to that they cannot do the smallest thing without being
in it. The better sort have often a finer matt to sit on, & the same is 513
us'd as a bed with a stool under their heads when they go to sleep and
a covering of the pieces of cloth they wear. Men, women & children 352
lye in the same place without seperation, unless a few who have a 285

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[1] The foregoing sentence seems to be describing a spear, *tao*, the next one the clubs, *akau*, even though in the one next succeeding Anderson reverts to spears. Both were made of Toa, *Casuarina equisetifolia*.

[2] Again whale tooth ivory, Tongan *lei*.

denotes local worship. The Malaees are however doubtless public 776
places for that purpose, as their solemn rites are perform'd there, and
their superiority with respect to situation and extent which far 778
exceeds any of their private habitations argues; besides there can be 346
no other reasonable conjecture offer'd about the persons who pro-
nounc'd the orations in performing the Natche & the two that began 799
the same thing when we first went with Poulaho, than that they were
no other than priests and at that time absolutely prefering some
petition to this invisible being. The next part of their creed is a belief 776
in the plurality of deitys, though all inferior to this one, amongst
whom they mention Toofooa boolootoo[1] god of the clouds and fogg, [821]
Talle te'boo[2] and some others residents of the heavens. The first in
rank and power, who has the government of the sea and its produc- [823]
tions, is call'd Footo'fooa[3] who they say is a male and has for wife
Fykava ka'jeea,[4] and here as in heaven there are several inferior ones
as Va'hââ-fonooa;[5] Tareeava;[6] Matta'ba-E'varoo[7] &c. The same re- [184]
ligious system does not however extend all over the cluster of isles;
for the supreme god of Hapaee for instance is call'd Alo Alo,[8] and [775]
other isles have two or three of different names, but their notions of
the power and other attributes of these beings would be reckond
erroneous with us, as they suppose that after death they have no
farther concern with them.

They have however very proper notions of the immateriality and 774
immortality of the soul. They call it life, the living principle or what
is more agreeable to their notions of it an O'tooa,[9] divinity or in- 775
visible being, and say that immediately on death that of their chiefs
seperates from the body and goes to a place calls 'Boolootoo,[10] the 776
chief or god of which is Gooleho.[11] This Gooleho seems synonymous [774]
with our Death, for all (even you & the men of Feejee speaking to us)
say they are subject to the power and dominion of Gooleho. They feign 775
that this country was never seen by any person, is to the westward
beyond Feejee[a] (from whence one might suppose it is the most distant
land they know, as many nations have plac'd their heaven in such a

[a] This shows that their notions of distance & duration extend but a little way as they [823]
suppose an everlasting place may be on the globe.

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[1] Probably this is the same as Mariner's 'Too'i fooa Bolotoo'—Tu'i fua Pulotu, 'Chief [775]
of all Pulotu'—Pulotu being the afterworld.

[2] Taliaitupou, the god of the Tu'i Kanokupolu; also god of war. [649]

[3] This god eludes me, even though 'first in rank and power'.

[4] Faikavakisia, elsewhere said to be male.

[5] Fakafanua, or Tu'i Haa Fakafanua. [6] Taliafa ? [7] Matapa'i-valu ?

[8] Aloalo was 'God of wind and weather, rain, harvest, and vegetation in general', says [821]
Mariner, II, p. 107. His sanctuary was in Lifuka. [824]

[9] *'Otua.* [10] Pulotu. [11] Hikuleo. [779]

[1777]

283 Their Cordage is another considerable article which they make of the rind of the Cocoa nut. Some of this they have of a thickness of a [226] 4 or 5 inch rope, which is used in the rigging of their Canoes; fishing [286] & other small Lines they make exceeding neat and strong from the Fibres of a Plant[1] & of these Lines they make excellent fishing Nets.

These people excell in making baskets, of which they have 3 or 285 four different Sorts & sizes all made of the rind of the Cocoa nut; one kind is made very strong which is that in most common use, another which is more for Shew are made exceedingly neat & beautiful with white beads & sometimes red feathers worked in them, these we esteemed as some of the greatest Curiosities among them; a third sort are constructed in an odd manner & have a very antique Appearance which made us compare them to Cathedrals[2]—they have other Sorts 391 still but those above mentioned are the principal. Their other Manufactures consist of their weapons of war which have been 412 already mentioned, their fishing Tackle of various Sorts, much like 301 those of Otaheite, their working Tools which consists of an Adz made of blue Stone, a Shark's Tooth fastened to the end of a Stick for 306 a graving Tool, and Files and their Jewellery, such as Necklaces of 237 various Sorts, some made of small shells of various colours & prettily disposed, others of the Legs of fowls, which however odd they may Sound, these people contrive to make into ornaments for their women's Necks and are no bad ones.

501 Their Canoes are of two Sorts, double & single and of a very curious construction & well finished & must cost them much Labour, they consist of several pieces of plank very ingeniously adapted to each other & sewed together on the inside of the Canoe; the single ones are in general large enough to hold six people, have an outrigger to them & are covered over with a deck at the Head and Stern under [531] which they stow the different articles they carry in them. On these decks they fasten 10 or a dozen white Shells as ornaments & at the stern there is a Support for a fishing rod which they generally carry along with them. The double or sailing Canoes are built large & strong with a Stage, on which a Hut is built. Some of them are capable of carrying 80 or 100 Men & can keep the Sea a long time [285] in these Latitudes. Their Sails are made of strong Matting & have [531] generally the Image of a Cock upon them.

Their musical Instruments consist of a Flute, a small instrument 534 called by the Natives Meemeeah,[3] and Drums. The Flute is made

[824]

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[1] Tou, *Pipturus argenteus*; or Fau, *Hibiscus tiliaceus*.

[2] It is hard to guess what Samwell means by this—perhaps the top edge of some baskets, like an immense saw-tooth.

[3] *mimiha*, Pan-pipe.

142 The Women are in general handsome tho' many among them
somewhat masculine, & it was the general Opinion that in female
softness & Delicacy they were excelled by the Otaheite Ladies, who
from being more covered are of a fairer Complexion; however we
saw great Numbers of Girls here as beautiful or more so than any at
Otaheite & who in Symmetry & proportion might dispute the palm
291 with any women under the Sun. They wear much the same kind of
[301] Clothing as the men & wear necklaces of Shells and the Legs of
Fowls & some made of a small black Seed.[1] They are clothed from the
[237] Waist to the Knees & all the other parts are exposed. The lower Class
[824] of young women have their Hair cut short, while those of the Agee
order wear it long & flowing down their Shoulders which had a
565 graceful and a truly elegant Appearance, & made us lament that the
superstitious Custom of mourning for the dead should deprive a
302 young Creature as beautiful as Venus herself of her chief Ornament,
[765] which is always the Case on the Death of the Chiefs or their own
Relations. As to modesty these women have no more Claim to it
831 than the Otaheiteans, we have had on board the ships large Companies of them dancing stark naked, at the same time using the most
565 lascivious Gestures.[2] These Agee Girls, as we called them, never came
609 on board the Ships, nor were their favours to be purchased for
Hatchets or any thing else that we had, they are kept inviolate for
836 the Chiefs who marry them. After lying in the women stain their
846 bodies & faces of a yellow Colour[3] & this they continue to do for a
certain time. Polygamy seems to be allowed at these Islands to the
302 Chiefs some of whom had four or five wives, tho' it is probable that
595 none but those of the first Consequence are allowed as many, the
generality of the people having only one.

565 We saw 4 or 5 white people at these Islands and at Annamooka a
Child of about a year old, they are all much alike in their Persons &
143 appearance, all small slender people with very weak eyes that can
hardly bear the light; their Skin where it is not covered is rough &
cracked & of a red Colour that under their Cloaths is exactly like the
skin of an European. It is the Opinion of some that the whiteness of
the Skin is occasioned by a Distemper, if it be so it is a distemper that
is born with them; it is certain that they have a very puny sickly
appearance & are altogether a disagreeable ugly looking people. We
saw no Women of this Colour.

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[1] The berries of the Poro, *Solanum nigrum*.

[2] The foregoing sentence is an insertion in the MS; hence the dislocation in the sense of the following one.

[853] [3] A mixture of turmeric and oil was used. It was supposed to aid the mother's flow of milk. The child was painted similarly.

535 The Tongans when seeing a modern rendition of the Hawaiian dance movement
829 *'uwehe* in which the knees were opened to the sides, were shocked
(traditionally in Hawaii this movement is done bending the knees
535 forward). A group of school children in Tonga did a take-off on
837 ballet for a program but refused to use their upper legs as is proper
in ballet which caused their performance to have very little resemblance
to classical ballet.

535 Movement of the upper leg is hindered by a tightly wrapped *vala*,
292 a garment which extends from waist to knee for both men and women.
Traditionally this wrap-around skirt-like covering was made of tapa;
today it is made of cloth. Only during dances do the women wear the
[291] *vala* to the knees. For ordinary street wear women wear the *vala*
extending from waist to ankle under Western style clothes. 'Traditional'
Tongan dance costumes used today consist of a *vala* of tapa
(or cloth) completely covered with ti leaves, shells, seeds, or layers
of tapa. On top of this dancers wear a waist mat (*ta'ovala*) of
woven pandanus or a flower or leaf girdle (*sisi*) which extends downward
several inches from the waist. This clothing not only restricts
movements of the hips and upper legs but also hides any movement
made there.

[824] Today for one type of dance called *tau'olunga* a skirt of shredded
hibiscus inner bark (*fau*) is sometimes worn, especially for informal
535 or tourist type occasions. During this kind of dance the movements
of the legs are a bit more free, but it is always the lower leg which

535 **Tane**

Tane consists of M.I.a.21. performed with both hands, one facing to the side the other facing down and resting the fingertips on the first finger of the other hand. It is often performed three times in succession while moving between arm positions of M.I.b.28. *Tane* is not in dictionaries, but was given by informants as a term for this movement. The name *tane* may interpret the resting of one object on another.

Toli

Toli means to pick (either flowers or fruit) and again describes
535 the movement rather than naming it. Flowers are very often used to
824 symbolise chiefs. More specifically, the symbolism is often in terms
565
of necklaces of flowers made in special ways, '*kakala hingoa*.' When
[538] referring to chiefs in dance poetry, it is usually in terms of
535 allusions to picking flowers to make chiefly flower garlands. The dance movement which alludes to this allusion is often *toli*. In the *toli* motif, the *toli* or picking part usually follows after a '*haka*' in the same arm position in which *toli* will be performed. The *toli*, M.I.a.20., morphokine, when it means *toli*, is usually performed with the lower arm in a vertical position such as A_9 or A_{15}.

Tafi

Tafi is both the name of a dance and a term used for a movement. Single quotation marks will be used to designate '*tafi*' as a movement.

70: Skinner A-5 (1965) 1969 OU9 Tonga OU9
Vava'u

FRAGMENT OF A CARVED BOX FROM VAVA'U

H. D. Skinner

In Vava'u in October, 1965, Tufua 'Utoikamanu showed me a number of 415
pieces illustrating material culture of earlier times. Among them was a fragment [124]
about 48 inches long of a carved rectangular box made of breadfruit wood. She
told me she had received it as a gift from her father, Fekaleaki 'Utoikamanu, [824]
who stated that he had secured it at Tu' anikivale, Vava'u. When complete it
had been used to hold arrows (*nga hau*). Tufua believes the surface shown is
the side of the box, but it seemed to me to be part of the bottom. Along one
edge of the side it has two chisel-cut holes. It would appear that through these
holes passed the cords attaching lid to body. Fekaleaki said he had intervened
to preserve the fragment when the box had been carelessly mishandled. The [531]
decorative motive represents interlacing series of cords or braids, a motive
frequently present in the decorative pattern of Tongan war clubs. This same [411]
motive is present also in Tongan stone work.(1) The box appears to be related
to the Maori treasure-boxes often loosely called *waka-huia*.

Fekaleaki stated that many years ago his nephew told him he had been 764
present when a body was being moved from an ancient grave. When the dressed
stone slabs enclosing the grave were moved a wooden box was seen enclosing
bones and hair. The coffin was decorated precisely in the style of the box here [511]
figured.(2) When exposed to outside air the coffin crumbled to dust. The human
hair and the bones were wrapped in fresh mats and were buried in a new grave.

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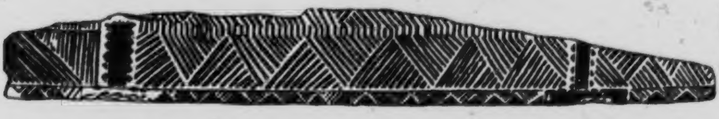
REFERENCE

McKERN, W. C., 1929. *Archaeology of Tonga.* Honolulu, Bernice P. Bishop Museum Bulletin 60.



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1. McKern 1929: Plate IIIC. "Incised decorations on stone of the Langi Katoa, Mua, Tongatabu". Stone on right has pattern identical with that on box fragment.
2. The line drawing is by K. M. Peters.

[427 cont.]

114 He [428] will ^A^ admire an elegant flowing robe which involves the whole
291 head and body, in an island where the women very rarely cover
302 the shoulders and breast; and he will be struck with awe and delight
by the figure of a divine old man, with a long white beard, though
all the people of Ea-oowhe shave themselves with muscle-shells.

175 123 We soon left the landing place, and followed the chief, who
175 invited us up into the country. The ground from the water's side
311 rose somewhat steep for a few yards, above which it flattened into
a beautiful green lawn, surrounded by tall trees and tufted
175 shrubberies, and open only to the sea. At the bottom of it, which
342 might be about one hundred yards from the landing-place, we saw a
very neat well-looking house, of which the roof sloped down within
[123] two feet of the ground. We advanced across the delightful green,
which was so smooth, that it put us in mind of the finest spots in
England, and were entreated to sit down in the house, which was most
elegantly laid out with mats of the best workmanship. In one corner
of it we saw a moveable partition of wicker-work standing upright,
and, from the signs of the natives collected, that it separated their
● [824] bed-place. The roof, sloping down on all sides, was formed of
a great number of spars and round sticks very firmly connected, and
covered with a sort of matting made of banana leaves.

175 [429] We were no sooner seated in the house, surrounded by a
533 considerable number of natives, not less than a hundred, than two
[609] [123] or three of the women welcomed us with a song, which, though exceed-
[171] ingly simple, had a very pleasing effect, and was highly musical
when compared to the Taheitian songs. They beat time to it by
snapping the second finger and thumb, and holding the three remaining

A [Forster is critiquing an illustration in Cook's published account—
A Analyst.]

[436 cont.]

175 tortoise-shell, but in shape exactly resembling the Taheitee fish-
439
237 hooks, called witte-witte (11); some of which were near seven inches
227
171 11. See Hawkesworth, vol. II. p.218. Also Parkinson's Journal, p. 77, and Tab. XIII. fig 25.

175 long. They likewise bought their shells, which hung on the breast,
439 their necklaces, bracelets of mother of pearl, and cylindrical sticks
301
[237] for the ear. They had the neatest ornamental combs that can be
[824] imagined, consisting of a number of little flat sticks about five inches
[531] long, of a yellow wood like box, most firmly and elegantly connected
together at the bottom by a tissue of the fibres of coco-nut, some
of which were of their natural colour, and others dyed black.
175 These fibres were likewise employed [437] in making a great variety
285 of baskets, wrought with regular compartments of two colours, brown
531
and black, or sometimes all brown, and ornamented with rows of
round flat beads, which were made by cutting pieces of shells into
that shape. The taste and the workmanship of these baskets were
elegant in the highest degree, and varied into different forms and
175 patterns. Those little stools, which serve as pillows for the head,
171 were much more frequent here than at Taheitee; flattish bowls, in
515
415 which they place their meat, and spatulas with which they mix up
824 the bread-fruit paste, were likewise in great abundance, and
made of the club-wood (casuarina equistifeolia), which had this
name from supplying all the islanders in the South Sea with
175 weapons. The clubs of the people of this isle, were of an infinite
411 variety of shapes, and many of them so ponderous that we could scarce
manage them with one hand; the most common form was quadrangular,
so as to make a rhomboid at the broad end, and gradually tapering
into a round handle at the other. But many were spatulated, flattish,

[447 cont.]

000

175 out of the boat. A party of the marines were posted on the beach
648 in case of danger, to protect the captain's clerk, who traded for
[439] provisions. The natives did not express either surprize or dislike
at this proceeding, perhaps because they were unacquainted with its
175 meaning. They received us with acclamations of joy as at Ea-oowhe,
609 and desired us to sit down with them on the rocks along shore, which
133 175 consisted of coral, and were covered with shell sand. We purchased
439 several beautiful parroquets, pigeons, and doves, which they brought
231 to us perfectly tame; and our young Borabora-man Mahine (or Hedeedee)
237 traded with great eagerness for ornaments made of bright red
feathers, which he assured us had an extraordinary value at Taheitee
175 and the Society Islands. Here they were commonly pasted to aprons
292 used in their dances, and made of the fibres of [448] coco-nut,
237 824 or fixed upon banana leaves, forming rhomboidal frontlets or diadems, &c.
000 With a degree of extasy which gave the greatest weight to his assertion,
he shewed us that a little piece of feathered-work, as broad as two
or three fingers, would purchase the largest hog in his island.
114 Both this youth and O-Mai were much pleased with the inhabitants of
175 these islands, and began to understand their language tolerably well.

175 We left the beach after the first acquaintance with the natives,
311 and ascended a few feet into a wild forest consisting of tall trees,
[137] intermixed with shrubberies. This wood though narrow, being in
many places not above one hundred yards wide, was continued along
the shore of Van Diemen's road, being more or less open in various
parts. Beyond it the whole island was perfectly level. We walked
across a piece of uncultivated land, about five hundred yards wide,
which adjoined to the wood. Part of it appeared to have been planted

[168 cont.]

133 and tufts of trees, which gave them a most enchanting appearance.
137 The houses were seen in great numbers among the trees on the beach,
175 and the islands had an air of happiness and affluence. One of these
361 181 little gardens rose at its east end into a white perpendicular cliff,
175 with something like horizontal strata. At our distance it looked
133 like the bastion of a ruined fort, and being fringed [169] with
137 175 woods and palms, formed altogether a romantic view. Towards noon
609 the wind slackened, and canoes put off from different islands to visit
175 us, though they were above a league distant. Some of them worked so
hard, that they were near us in less than an hour; and when they were
about to musket-shot off, they began to call to us from time to time,
still continuing to paddle towards us. Three persons were in the
canoe, exactly like the natives of Ea-oowhe and Tonga-Tabboo, whom
439 we had seen in October, 1773. When they were along side, a few beads
175 and nails were presented to them, for which they immediately sent a
● [824] [609] bunch of bananas, and some delicious shaddocks (citrus decumanus) on
[592] the deck, besides a bunch of the red fruits of the palm-nut tree or
pandang (athrodactylis) which is a sign of friendship. This being
done, they sold us all the shaddocks and fruit which they had, and
609 came on board. In the mean while the other canoes arrived, and acted
175 without the least caution, as if we had been long acquainted. They
103 taught us the names of all the islands in the neighbourhood, that
175 with the high cliff they called Terrefetchea; the other, which we
admired so much for its beauty, Tonoomea: both these lay to the eastward of us. Mango-nooe (great) and Mango-eetee (little) were two
islands to the west of us; and to the S.W. beyond them lay Namoka-nooee and Namoka-eetee; the first of which Tasman has called Rotterdam

The Village and the Research Scene

101 The village selected for research is on the main island of the
103 Tonga group, Tonatapu. Its name is Puke (pronounced Pookay, please).
[361] Gifford (1926: 196) in his catalogue of Tongan place names enters Puke
as the gloss of fortress.[A] However, the term has several seemingly unrelated definitions in the Tongan language; the villagers thought the
name referred to a small hill in the village as the term denotes the
small hill above a planted yam. The village is located about 3 miles
[361] west of Nuku'alofa; it is $^1/4$ mile from the main road going west from
[131] Nuku'alofa and about twice that distance from the lagoon to the north
(See Map 2).

133 The terrain of the village and surrounding lands is flat and low-
361 lying. Village boundaries are easily distinguishable as fallow, and
[241] producing garden plots stop abruptly at the perimeters of the village
compound. For some purposes the village and its population are divided into three geographically defined sections. The sections are the eastern section (*vahe hahake*), the central section (*vahe loto*), and the western section (*vahe hihifo*); the sections are under the leadership of the noble, the church steward, and the town officer, respectively.

361 Within the village are small patches of low-lying bush and many
245 trees have been left standing or planted; most prominent among the latter are the coconut palm (*niu*), breadfruit (*mei*), mangoe (*mango*), and
[824] tje *tava* and '*ifi* trees. Many of the plants and trees growing within
[262] the village have uses as food, medicine, or decoration.
[278]

A.[What Gifford actually says is "the outworks of a fortress". See 4: Gifford, this file p.196--Analyst

76: Yuncker

OU9 Tonga OU9

192
824

[For an index of native plant names, see Category 116, pp. 280-283.]

The conspicuous and apparently well-established cultigens, as well as introduced weedy species, were either collected or noted and are, for the most part, included, as I believe that such information is of value in helping formulate a proper concept of the flora of any region. So far as I know, many of these introduced or migrant species are covered in no previous report on the Tongan flora. 126

In this work, 49 lower cryptogams, 71 pteridophytes, and 630 spermatophytes are recognized, making a total of 750 species and varieties. 137

The late Sir Peter Buck, then Director of Bishop Museum, originally suggested the desirability of a botanical survey of Tonga and assisted in the preliminary plans. The government of Tonga was interested in the project and, through Prince Tungi, rendered aid in every way possible. Mr. Willy Straatmans, Director of the Department of Agriculture, was most helpful in arranging for transportation between the islands, for living quarters in government rest houses, and for local transportation by land-rover on the islands of Tongatapu and Vava'u. 122

I was fortunate in obtaining the assistance of W. Toluta'u Ha'angana, a member of the Tongan department of agriculture staff, who served as chief assistant for the entire period of the work. "Tolu" proved to be a most intelligent and cooperative assistant at all times, and his knowledge of Tongan plants was considerable. Most of the local names given in this report were supplied by him, as well as the information about the uses made of the plants by the Tongan people. On many occasions his explanation for our presence on plantations or other private property of suspicious owners unable to understand English smoothed the way and avoided trouble. His agility in procuring drinking coconuts was likewise much appreciated. 114 115

Tongans do not always distinguish between closely related plants and sometimes apply the same name to more than one species. Also, occasionally the same name is given to widely different species, leading one to suspect that some names are erroneous. Such presumed errors were checked as far as possible and, if obviously wrong, eliminated. Where two or more names have been supplied for a given species, the one believed to be more commonly used is listed first. 824 128

In the identification of the collections I am greatly indebted to a number of specialists. The fleshy fungi were identified by Dr. J. A. Stevenson; the liverworts, by Dr. Margaret Fulford; the lichens, by Dr. Carroll W. Dodge; the mosses, by Mr. E. B. Bartram, who also furnished the description of the new species; the description of the new *Podocarpus*, by Mrs. Netta Gray; the pteridophytes (excepting *Selaginella*), by Mr. C. V. Morton; *Selaginella*, by Mr. A. H. G. Alston; the grasses, by Dr. J. R. Swallen; the orchids, by Mr. Charles Schweinfurth; *Ficus*, by Mr. W. J. H. Corner; *Pipturus* and *Santalum*, by Dr. Carl Skottsberg; certain members of the Apocynaceae, by 000

137 This species[1] is frequently used as an ornamental about dwellings, in cemeteries, and so forth.

[824] Tongan name: *longolongo*.

[262] The seeds are said to be edible.

FAMILY PODOCARPACEAE

Genus Podocarpus L'Héritier

Podocarpus pallidus N. E. Gray, sp. nov. (fig. 6).

Arbuscula vel frutex 2-6 m. altus, trunco ad 20 cm. diametro, cortice extimo cinereo vel in ramis junioribus fusco, cortice interiore clare rubro-fusco; ramulis numerosis ad ramorum apices verticillatis; alabastris parvis ovatis 2 mm. latis, squamis exterioribus 2-7 mm. longis anguste triangularibus carinatis, apice acuto-acuminatis vel longe attenuatis patentibus vel recurvatis; foliis plerumque ad ramulorum apices confertis, saepe patentibus, pallide viridibus, lanceolatis vel lineari-lanceolatis, 2.5-11 cm. longis, 6-11 mm. latis (juvenilibus 10.5-15.3 cm. longis et 13.5-17 mm. latis), apice breviter acutis vel acuminatis interdum mucronatis, basi in petiolum breve crassum plus minusve gradatim angustatis, margine interdum revolutis; costa supra plerumque basim versus subtiliter prominente, superne complanata vel impressa, subtus late prominente; foliis cum ductis resiniferis 1-5 sub vasi phloemate et interdum 2 supra xylum; strobilis masculis axillaribus sessilibus solitariis parvis ovatis, squamis exterioribus acuto-triangularibus valde carinatis scarioso-marginatis; strobilis masculis maturis 1-1.3 cm. longis et 4 mm. latis eburneis; microsporophyllis triangularibus, apice acutis; strobilis foemineis axillaribus solitariis pedunculo crasso 6-15 mm. longo enatis; receptaculo squamis 2 vel 3 coalescentibus carnosis inaequalibus 7-9 mm. longis demum rubescentibus composito, bracteolis 2 parvis subulatis 2 mm. longis basi subtento, saepe 1-ovulato; semine globoso vel subgloboso carnoso, 10-13 mm. longo, 8-10 mm. crasso, glauco vel caesio, obtuso vel obscure cristato.

'Eua: western plateau region, *Parks 16212*, female (type specimen F*, MO*, US),[3] Powell Plantation, *Parks 16319* (UC*); above Fuai Plantation, near center of island, Mar. 18, 1953, *Yuncker 15319* (US). Found in forests at 200-250 m. alt. on this island.

Vava'u: upper rim of seaside limestone cliff, above Leimatua, on northern side of island, frequent, May 20, 1953, *Yuncker 16082* (US*); in thicket along upper rim of limestone cliff on eastern side of island below Ha'alaufuli, May 22, 1953, *Yuncker 16099* (US*). Found at an altitude of 120 m. on this island.

Tongan name: *uhiuhi*.

P. pallidus is endemic in the Tongan islands and is the easternmost extent of the distribution of this genus in the southwest Pacific regions. It is a typical *Eupodocarpus* type; the seed has a fleshy outer coat and the receptacle is greatly enlarged and fleshy. It is placed in subsection *F* of *Eupodocarpus* because true resin canals are sometimes found above the vascular bundle. This distinguishing character is found only in species from Fiji, Tonga, and New Caledonia. The species most nearly related to it is *Podocarpus decipiens* Gray

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[3] An asterisk after the name of, or symbol for, a herbarium following the specimens examined signifies that the details of the leaves of this specimen have been examined in cross section.

1 /Cycas circinalis Linnaeus--
^ Analyst/

[TEXT CONTINUED ON PAGE 48]

137 in the Fijian islands from which it differs in the abruptly acute, mucronate leaves, the pale green color, and the solitary, sessile male cones. The specimens have previously been called *P. elatus* R. Brown, a species which is not found outside of Australia except in cultivation and from which it differs by the solitary male cones and the interrupted hypoderm on the upper side of the leaves. In *P. elatus* the male cones are in pairs.

FAMILY ARAUCARIACEAE

Genus **Araucaria** Jussieu

Araucaria excelsa R. Brown, in Aiton, Hort. Kew., ed. 2, 5:412, 1813 (fig. 1, *a*).

Tall, stately tree with excurrent stem and whorled, horizontal to somewhat ascending, fanlike branches. Leaves small, stiff, awl- or scale-shaped, imbricated, the cones large and woody.

Tongatapu: near beach in Nuku'alofa, Nov. 23, 1951, *Hürlimann 291*.

[824] A number of specimens of this fine ornamental tree are planted about the grounds of the palace where they have attained a height of 25 m. or more. They were not seen elsewhere in Tonga.

Tongan name: *paini*.

[245] This tree is a native of Norfolk Island, and is now widely cultivated as an ornamental.

FAMILY PANDANACEAE

Genus **Freycinetia** Gaudichaud

Freycinetia urvilleana Hombron, in Dumont d'Urville, Voy. Astrolabe et Zélée, pl. 3, 1843.

High-climbing, coarse liana, the stem up to 2-3 cm. or more thick, clinging by aerial roots. Leaves narrowly lanceolate, long-acuminate and sharply acuminate, widened and clasping at base, up to 45 cm. or more long and 5 cm. wide, approximate toward ends of stems. Flowers lacking perianth, crowded in terminal or axillary fleshy clusters, dioecious.

'Eua: June 1926, *Parks 16279;* climbing high in deep forest near center of island, Mar. 22, 1953, *Yuncker 15433*.

Occasional. Endemic to Tonga.

Tongan name: *kahikahi*.

Genus **Pandanus** Linnaeus

Pandanus tectorius Parkinson, Jour. Voy. Endeavour, 46, 1773.

Stout, branching tree, up to 5 m. or more tall, with numerous, aerial brace roots. Leaves up to 2 m. long and 7 cm. wide or smaller, apex long, slender, acuminate, margins and midrib armed with short, sharp spines. Fruit subglobose, up to 25 cm. thick.

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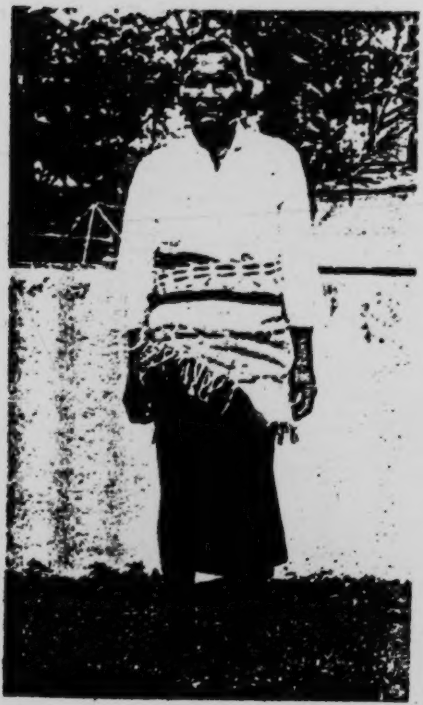

FIGURE 7.—Tongan man wearing the apron-like *tautala* of woven *Pandanus* leaves. The *tautala*, a characteristic and unique part of the Tongan dress, is worn by both sexes.

Tongatapu: *Cook;* on uplifted coral plateau near sea at Houma, forming a distinct zone with dense growth, Oct. 28, 1951, *Hürlimann 12;* in thicket along rocky coast at Hufangalupe, Feb. 26, 1953, *Yuncker 15067.* 137

'Eua: margin of forest, near central part of eastern coastal ridge, Mar. 24, 1953, *Yuncker 15459.*

Vava'u: *Crosby.*

Common throughout Tonga on the lower terraces near the sea or on sea-facing cliffs. Polynesia to southern Asia.

Tongan name: *fa.*

The leaf fibers are much used in mat and basket weaving (fig. 7). The fruit segments may be chewed and used as food during times of food scarcity. 824 285

An interesting discussion of the status of the binominal *Pandanus tectorius,* 137 usually now preferred to *P. odoratissimus*, is found in Merrill's report on Cook's Voyages (Chron. Bot. **14**: 354-356, 1954).

Martelli (Univ. Calif. Pub. Bot. **12**: 356 ff., 1930) lists the following varieties and species as occurring in Tonga.

Pandanus odoratissimus L. f. [= *tectorius* Parkinson] var. **savaiensis** forma **major** Martelli.

'Eua: Powell plantation, June-July 1926, *Parks 16292.*

Pandanus odoratissimus var. **pseudo-linnaei** Martelli.

Tongatapu: Vahe Ha'ake, near houses, June 21, 1926, *Setchell and Parks 15359.*

Tongan name: *fa hina.*

Pandanus odoratissimus var. **setchellii** Martelli.

Tongatapu: belt of trees at Hufangalupe, June 28, 1926, *Setchell and Parks 15437, 15441.*

Tongan names: *fa hina, hingano.*

Pandanus ordoratissimus var. **pyriformis** Martelli.

Tongatapu: Nuku'alofa, Aug. 1926, *Setchell and Parks 15644.*

Tongan name: *fa vula.*

Pandanus odoratissimus var. **sinensis** Warburg.

Vava'u: *Setchell 15651.*

Tongan name: *falahola.*

Pandanus whitmeeanus Martelli.

Tongatapu: *Setchell and Parks 15650.*

Tongan name: *paogo.*

Pandanus corallinus Martelli.

Tongatapu: June 1926, *Setchell and Parks 15420.*

Tongan name: *fa kula.*

[824] [285] Additional Tongan names furnished were said to represent different forms recognized by the Tongans: *fafa, loukie* [used for weaving thin, soft mats], *loutotolo* [leaves not spiny], *tofua, tapahina* [leaves white-striped = *P. veitchii* Hort. ?], *tutuila* [leaves not spiny]. Specimens of these additional forms were not collected.

FAMILY POTAMOGETONACEAE

Genus Syringodium Kützing

Syringodium isoetifolium (Ascherson) Dandy, Jour. Bot. **77**: 116, 1939.

Submerged herb, stem prostrate, branching, widely spreading. Leaves linear, sheathing at base. Flowers small; fruit small, nutlike.

137 **Halophila ovalis** var. **bullosa** Setchell, Carnegie Inst. Washington, Pub. **341**: 114, fig. 6, 1924.

Leaves commonly about 5 mm. wide and 1.5 cm. long, elliptic or elliptic-subspatulate, blades strongly bullate, petioles as long as, or longer than blades.

Tongatapu: on reef west of Nuku'alofa, July 15, 1926, *Setchell and Parks 15553.*

Nomuka: on sand in shallow water, exposed at low tide, below village, Apr. 30, 1953, *Yuncker 15806.*

Lifuka: on sand in shallow water, beach south of Pangai village, May 11, 1953, *Yuncker 15976.*

Frequent throughout Tonga. Also in Samoa.

FAMILY GRAMINEAE

Gramineae identifications are by J. R. Swallen.

Genus **Bambusa** Schreber

Bambusa vulgaris Schrader, in Wendland, Coll. Pl. **2**: 26, pl. 47, 1810.

Coarse erect tufted grass up to 5-10 m. or more tall stems becoming thick and very hard. Blades lanceolate acuminate up to 35 cm. or more long and about 4 cm. wide but frequently smaller, sheaths auriculate at apex. Flowering infrequently, spikelets 1.5 cm. long, in large, paniculate clusters.

Tongatapu: edge of coconut plantation near Nualei village, Mar. 9, 1953, *Yuncker 15224;* in low area along trail between village of Fatai and sea, Mar. 10, 1953, *Yuncker 15256.*

Vava'u: in thicket near upper rim of steep seaside cliff along northwestern side of island, May 25, 1953, *Yuncker 16161.*

Infrequent. Widely distributed in tropical countries.

[824] [342] Two different varieties are recognized by the Tongans: a green-stemmed form called *kofe*, and one with yellow stems called *pitu*. The stems are used in house construction.

Genus **Eragrostis** Beauvois

Eragrostis amabilis (Linnaeus) Wight and Arnott, in Hooker and Arnott, Bot. Beechey Voy., 251, 1841.

Small, annual grass with erect or abruptly ascending, slender, glabrous stems up to 25 cm. or more tall. Blades up to 10 cm. long and about 4 mm. wide, sheaths long-ciliate about top. Spikelets four- to six-flowered, small, about 1 mm. long, inflorescence branches filiform, spreading to ascending in an open, usually narrowly oblong panicle, palea ciliate.

Tongatapu: in margin of grassy dooryard along coast road east of Nuku'alofa, Mar. 7, 1953, *Yuncker 15204.*

Lifuka: margin of coastal road north of Pangai, Apr. 25, 1953, *Yuncker 15726.*

Tafahi: in grassy area near school house, Dec. 17, 1951, *Hürlimann 580.*

Niuatoputapu: near shore near Vaipoa, Dec. 7, 1951, *Hürlimann 378.*

Occasional. Widespread in warm countries.

Genus **Centotheca** Desvaux

Centotheca lappacea (Linnaeus) Desvaux, Soc. Philom., Nouv. Bull. 2: 189, 1810.

Erect, rather stout grass, the culms up to 80 cm. or more tall. Blades lanceolate, up to 15 cm. long and 1-3 cm. wide. Spikelets green, about 5 mm. long, in terminal panicles up to 15 or 20 cm. long, branches several, slender, spreading.

'Eua: in ravine above Fuai, on steep slope in forest, Nov. 8, 1951, *Hürlimann 168.*

Vava'u: on forested slope, margin of Lake Anovai, May 19, 1953, *Yuncker 16048;* in open area along upper rim of coastal limestone cliffs on northwestern coast, May 25, 1953, *Yuncker 16174.*

Tafahi: in forest along road from Tafahi township to Piu 'o Tafahi, Dec. 10, 1951, *Hürlimann 414.*

Niuatoputapu: border of breadfruit plantation on south side of mountain ridge, opposite Vaipoa, Dec. 27, 1951, *Hürlimann 635;* on northwest side of the ridge above Hihifo in clearing in forested area, Dec. 5, 1951, *Hürlimann 337.*

Occasional throughout Tonga. From Tropical Africa and Asia through Malaya to Australia and Polynesia.

Genus **Arundo** Linnaeus

Arundo donax Linnaeus, Sp. Pl., 81, 1753.

Stout, coarse, reedlike grass, culms clumped, up to 5 or 6 m. tall, rhizome thick and knotty. Blades rather long, distichous, up to 5 cm. or more wide, margins scabrous. Panicle large, up to 50-60 cm. long, spikelets about 12 mm. long, the lemmas densely soft-hairy.

Lifuka: in old clearing about mid-island along trans-island road between Pangai and eastern side of island, May 6, 1953, *Yuncker 15767.*

Infrequent. Widespread in warm countries.

Tongan name: *kaho folalahi.* The stems are used in the construction of house walls.

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Genus **Vetiveria** Bory

Vetiveria zizanioides (Linnaeus) Nash, in Small, Fl. Southeastern United States, 67, 1913.

Coarse, erect, tufted grass, stems up to 2 m. tall, roots somewhat aromatic. Leaves distichous, blades up to 1 m. long and about 1 cm. wide, more or less folded. Spikelets

137 about 4 mm. long, rough with numerous sharp points, narrowly elliptic, acute, in a purplish, erect panicle up to 20 cm. or more long, panicle branches slender, whorled, erect to spreading.

Tongatapu: in sandy soil near beach east of Nuku'alofa, Mar. 7, 1953, *Yuncker 15216.*

'Eua: in village of Pangai, Apr. 7, 1953, *Yuncker 15660.*

Lifuka: margin of plantation along coastal road north of Pangai, Apr. 25, 1953, *Yuncker 15728.*

Occasional throughout Tonga. Introduced into cultivation in America.

Tongan name: *ahisiaina.*

[824] [302] The roots are used for scenting oil.

Genus **Lepturus** R. Brown

Lepturus repens R. Brown, Prodr. Fl. Nov. Hollandiae, 207, 1810.

Caespitose, freely branching, leafy, glabrous grass, culms creeping at base, ascending upward. Blades linear, acuminate, up to 20 cm. or more long but mostly shorter, and 4-8 mm. wide, narrowing to junction with sheath, more or less scabrous. Spikelets single, alternate, subsessile, in an internodal cavity, in slender, cylindrical spikes up to 15 cm. long and 1-2 mm. in diameter.

Tongatapu: in thin sandy soil on limestone bluff near Blow Hole area below Houma, June 1. 1953, *Yuncker 16223.*

'Eua: in sandy soil just above high-tide line near Ha'aluma, April 1, 1953, *Yuncker 15598.*

Lifuka: in sand just above high-tide limit, along beach on west coast north of Pangai village, Apr. 25, 1953, *Yuncker 15721.*

Frequent along the strand. Australia and Malaysia to Polynesia.

Genus **Sporobolus** R. Brown

Sporobolus indicus (Linnaeus) R. Brown, Prodr. Fl. Nov. Hollandiae, 170, 1810.

Rather densely tufted grass with slender, glabrous stems. Blades linear, acuminate, up to 15 cm. or more long and 2-3 mm. wide. Spikelets about 1-1.5 mm. long, numerous in erect, spikelike, narrow panicles up to 30 cm. or more long, branches filiform, ascending to spreading.

Tongatapu: roadside near Nualei, Oct. 29, 1951, *Hürlimann 29.*

'Eua: in grazing area, near Ohonua village, Apr. 2, 1953, *Yuncker 15622.*

Niuafo'ou: in open thicket, upper rim of main crater, May 16, 1953, *Yuncker 15991.*

Niuatoputapu: in grassy area in Hihifo, Dec. 5, 1951, *Hürlimann 327;* roadside south of Matavai toward coast, Jan. 2, 1951, *Hürlimann 647.*

Occasional. India, China, Malaya, Philippines, Fiji and tropical America.

Tongan name: *fisihina.*

137 **Panicum decompositum** R. Brown, Prodr. Fl. Nov. Hollandiae, 191, 1810.

Somewhat tufted, erect grass, flowering culms up to 50 cm. or more long, glabrous. Blades linear, up to 20 cm. or more long and 7 cm. wide, acuminate, sparsely pubescent. Spikelets 2-3 mm. long, on long, capillary, scabrous branches in an open panicle up to 30 cm. long and nearly as wide.

'Eua: occasional scattered plants in open grazing area above Fuai, Mar. 24, 1953, *Yuncker 15456*.

Infrequent. Central and western Australia.

Panicum maximum Jacquin, Icon. Pl. Rar. 1: pl. 13, 1781-1786.

Erect, coarse grass, up to 3 m. tall, stems up to 1 cm. thick near base, bearded at nodes. Blades linear-lanceolate, acuminate, up to 30 cm. or more long and 1.5 cm. wide, margin strongly serrate-scabrous. Spikelets 2-3 mm. long, green or purplish, on slender pedicels in large, diffuse panicles up to 30 cm. long, branches very slender.

Tongatapu: roadside east of Ma'ofanga, Oct. 29, 1951, *Hürlimann 22;* forming large colonies along road near Lavengatonga village, Mar. 6, 1953, *Yuncker 15175*.

Lifuka: about mid-island along road between Pangai village and eastern shore, Apr. 27, 1953, *Yuncker 15768*.

[824]
[246] Introduced as fodder grass but becoming established throughout Tonga. Widely cultivated.

Panicum trigonum Retzius, Observ. Bot. 3: 9, 1783.

This species was reported by Hemsley on the basis of a United States Exploring Expedition specimen; but no specimen of this species collected by the expedition can be found in the United States Herbarium and there is some question regarding the occurrence of the species in Tonga.

Genus Cyrtococcum Stapf

Cyrtococcum oxyphyllum (Hochstetter) Stapf, Hook. Icones, pl. 3096, 1922.

Decumbent, spreading grass, branching and rooting from lower nodes, stems slender, ascending to 40 cm. or more tall. Blades lanceolate, acuminate, 10-12 cm. long and 1 cm. wide, margins somewhat scabrous, sheath and lower surface puberulent. Spikelets about 1.5-2 mm. long, in dense, terminal panicles up to 10 cm. long.

Tongatapu: *Moseley;* weed in banana plantation near Nualei village, Mar. 9, 1953, *Yuncker 15234*.

Vava'u: *Barclay; Crosby;* on forested slope above northern shore of Lake Anovai, at southwestern end of island, May 19, 1953, *Yuncker 16047;* in clearing of old plantation at top of Talau, west of Neiafu, May 24, 1953, *Yuncker 16152*.

Occasional throughout Tonga. South Asia, Philippines, Pacific islands. *Panicum pilipes* Nees in Hemsley's and Burkill's lists.

137 Frequent along the strand throughout the group. Ceylon to Madagascar, Malaya, Australia, and Polynesia.

T. sarmentosa Pers. in Hemsley's and Burkill's lists.

Tongan names: *mohuku'apopoa, mohuku'apopoa tahi, musie liku, kefukefu.*

Genus **Spinifex** Linnaeus

? **Spinifex littoreus** (Burmann f.) Merrill, Philippine Jour. Sci. **7C**: 229, 1912.

Coarse, rigid, widely spreading, prostrate grass. Blades involute, rigid, short, aggregated toward tops of stems, sheaths somewhat imbricate.

Tongatapu: on sandy flats outside Fatai, water-covered at high tide, Oct. 30, 1951, *Hürlimann 73.* Specimen sterile.

Covers large areas locally. India, China, Malaya, and Polynesia.

Genus **Imperata** Cyrillo

Imperata cylindrica (Linnaeus) Beauvois, Ess. Agrost., 165, 1812.

Rather slender, somewhat tufted, erect grass with strong rhizome, flowering culms up to 50 cm. or more long, glabrous. Blades up to about 20 cm. or more long and 6 mm. wide, acuminate. Spikelets paired, unequally pedicellate, surrounded by long, silky hairs, in a terminal, narrow, silky panicle.

'Eua: plants scattered about in open grazing area below summit of eastern ridge, Mar. 24, 1953, *Yuncker 15457.*

Kao: in open grassy, alpine area, 600-900 m. alt., May 6, 1953, *Yuncker 15918, 15936.*

Infrequent. Warm parts of the Old World, Polynesia. Introduced into America.

Genus **Miscanthus** Andersson

Miscanthus floridulus (Labillardière) Warburg, ex Schumann and Lauterbach, Fl. Deutsch. Schutzg. Südsee, 166, 1901.

Tall, reedlike, tufted grass, culms pithy, up to 3 m. or more tall, erect. Leaves numerous, blades up to 1 m. long and 2 cm. wide, linear, long-attenuate-acuminate, margin scabrous. Spikelets in pairs, with a tuft of silky hairs at base, hairs about as long as spikelet, in long, slender, spikelike racemes forming a large fanlike panicle up to 30 cm. or more long.

Tongatapu: in low moist area near Nualei, Mar. 9, 1953, *Yuncker 15241.*

'Eua: on slopes of a large sinkhole area near center of island, Mar. 20, 1953, *Yuncker 15388.*

Lifuka: about mid-island along road from Pangai to east coast, Apr. 27, 1953, *Yuncker 15755.*

Occasional throughout Tonga. Malaysia to Polynesia.

Tongan names: *kaho, kaho foi'iki.*

[824] [312] The stems are used in the construction of house walls.

Genus **Saccharum** Linnaeus

Saccharum officinarum Linnaeus, Sp. Pl., 54, 1753. 137 824 249 342

The sugar cane is a common plantation crop, though not cultivated on a commercial basis. Tongans chew the stalks to obtain the sugary sap, and the leaves are used as thatching material (fig. 8). The Tongan name is *to* and at least seven varieties are distinguished as follows.

Au: stem is green; leaves supply a favorite material for house thatching.
Fo'ufa'u: stem is light green, with long internodes.
Heleveka: stem is red with white stripes.
Ngata hina: stem is green and thick.
Ngata kula: stem is red and thick.
To hina: stem is green and slender.
To kula: stem is red and slender.

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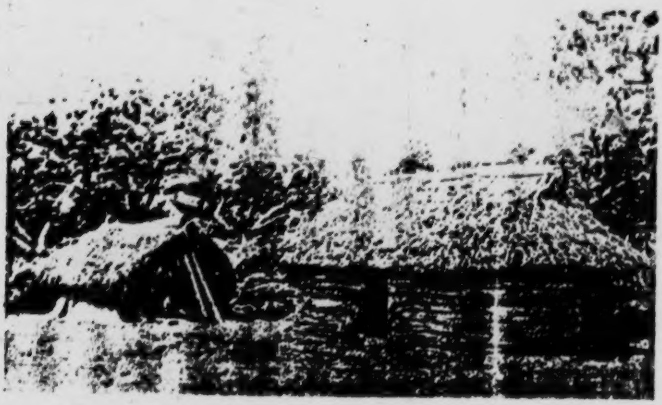

FIGURE 8.—Typical Tongan house showing characteristic oval shape, sugar-cane leaf thatch, and walls of interlaced coconut leaves.

Genus Andropogon Linnaeus

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Andropogon intermedius R. Brown, Prodr. Fl. Nov. Hollandiae, 202, 1810.

Erect, loosely tufted, rather stout grass, up to 1 m. or more tall. Blades linear, up to 50 cm. or more long and 5 mm. wide, the margins slightly scabrous, clasping at the base. Panicles purplish, up to 15 cm. or more long, branches very slender, ascending to spreading, sessile spikelets about 3 mm. long, bearing an awn about 15 mm. long.

'Eua: in open grazing area near top of eastern ridge, Mar. 24, 1953, *Yuncker 15440;* in open grassy area near center of island, Mar. 29, 1953, *Yuncker 15546.*

Vava'u: *Crosby.*

Occasional. Asia, Africa, New Hebrides, Australia, and Polynesia. *A. intermedium* R. Br. in Burkill's list.

Genus **Cymbopogon** Sprengel

137 **Cymbopogon refractus** (R. Brown) A. Camus, Rev. Bot. Appl. Agric. Colon. 1: *279*, 1921.

Tufted, somewhat aromatic grass, culms up to 1 m. tall. Blades linear, about 5 mm. wide and 30 cm. or more long, attenuately acuminate. Spikelets 5-6 mm. long, in pairs, one sessile, one pedicellate, in short, paired, spreading, racemes, these usually partly enclosed in sheath.

Vava'u: in grassy plain along upper rim of steep coastal cliff above Leimatua, May 20, 1953, *Yuncker 16069*.

Infrequent. New Caledonia, Fiji to eastern Polynesia.

Genus **Sorghum** Moench

Sorghum halepense (Linnaeus) Persoon, Syn. Pl. 1: 101, 1805.

Coarse grass with stems up to 1.5 m. tall, arising from stout creeping rootstocks. Blades up to 2 cm. wide, rather long, margin scabrous. Spikelets ovate, about 5 mm. long, silky hairy, with an awn up to 1.5 cm. long, abruptly bent at about middle, strongly twisted in lower part, in large open panicles up to 30 cm. or more long.

Tongatapu: near Nualei, Oct. 29, 1951, *Hürlimann 33, 50;* in old clearing near Fu'amotu village, Mar. 4, 1953, *Yuncker 15163*.

'Eua: in second-growth area, along trail between Pangai and Fuai, Mar. 25, 1953, *Yuncker 15476*.

Lifuka: in roadside ditch, along coastal road north of Pangai village, Apr. 25, 1953, *Yuncker 15722*.

● 824 246 Introduced as a forage plant but becoming established in waste areas throughout Tonga. Widely cultivated.

Tongan name: *kola*.

Genus **Rhaphis** Loureiro

Rhaphis aciculata (Retzius) Desvaux, Opusc., 69, 1831.

Small, decumbent grass, stems creeping and rooting at nodes, somewhat turf-forming, flowering stems ascending up to 25 cm. or more tall. Blades up to 10 cm. or more long and 5 mm. wide, linear, acuminate, mostly basal, margin scabrous. Spikelets purple, pilose at base, 4-5 mm. long, narrowly lanceolate, some of glumes with barbed awns, in narrow paniculate clusters up to 5 cm. or more long, branches slender, whorled or scattered.

Tongatapu: *Home;* along path, Nualei village, Oct. 29, 1951, *Hürlimann 26;* in grassy area in Lavengatonga village, Mar. 6, 1953, *Yuncker 15185*.

'Eua: in grazing area near center of island, Mar. 22, 1953, *Yuncker 15416*.

Vava'u: *Crosby*.

Tafahi: roadside between Tafahi and Faihavanui, Dec. 15, 1951, *Hürlimann 529*.

A common weed in open grassy areas throughout Tonga. Tropical Asia, Malaya, Polynesia.

The matured fruit is easily detached and has a barbed callus which works its way into clothing and becomes irritating. 137

Andropogon aciculatus Retz. in Hemsley's list and *Chrysopogon aciculatus* Trin. in Burkill's list.

Tongan name: *matapekepeka.*

Genus **Heteropogon** Persoon

Heteropogon contortus (Linnaeus) Beauvois, ex Roemer and Schultes, Syst. Veg. **2**: 836, 1817.

Rather coarse, tufted grass, flowering culms up to 60-80 cm. tall. Blades flat or folded, up to 7 mm. wide and 15 cm. or more long, glabrous. Spikelet sessile about 7 mm. long, slender, with pubescent awns up to 5-8 cm. or more long, awns bent and flexuous, raceme up to 5 or 7 cm. long, one-sided.

Vava'u: in loose soil on grassy plain along upper rim of coastal cliff above Leimatua, May 20, 1953, *Yuncker 16064.*

Infrequent. Pantropic.

Genus **Coix** Linnaeus

Coix lachryma-jobi Linnaeus, Sp. Pl., 972, 1753.

Tall, coarse, erect, branched grass with stems up to about 1 m. or more tall. Blades up to 30 cm. or more long and 3 or 4 cm. wide, acuminate, base broad, cordate, margins scabrous. Fruit hard, bony, usually gray or white, shining, ovoid, about 1 cm. long.

Tongatapu: *Forster; Moseley;* in thicket near village of Nualei, Mar. 9, 1953, *Yuncker 15230;* in plantation near Nualei, Nov. 1, 1951, *Hürlimann 114.*

'Eua: near dwelling in Pangai village, Apr. 7, 1953, *Yuncker 15659.*

Vava'u: *Crosby;* in wet boggy margin of Ngofe swamp, southwestern end of island, May 19, 1953, *Yuncker 16032.*

Occasional throughout Tonga. Found throughout the Old World tropics and introduced into tropical America.

Tongan names: *hana, hana tuikahoa.*

The fruits are used as beads in ornaments.

[824]
[301]

Genus **Ischaemum** Linnaeus

Ischaemum murinum Forster f., Fl. Ins. Australia, Prodr., 73, 1786.

Decumbent-ascending grass, ascending to 20 cm. or more, culms glabrous, somewhat branching. Blades linear, 10 cm. or more long and 3-4 mm. wide, pilose-ciliate downward, acuminate. Spikelets paired, aristate, awn up to 1 cm. long.

Tongatapu: on exposed limestone rock near Houma, Oct. 28, 1951, *Hürliman 11.*

Occasional.

Tongan name: *totoa.*

Genus Eleocharis R. Brown

Eleocharis dulcis (Burmann f.) Trinius, ex Henschel, Vita Rumph., 186, 1833.

Glabrous, erect plant, stems simple, longitudinally grooved, pithy. Leaves lacking. Spikes solitary, terminal, about 3 cm. long, as thick as stem.

Vava'u: *Crosby;* forms shoreward zone in shallow water, Ngofe swamp, on southwestern end of island, May 19, 1953, *Yuncker 16027.*

Known only from the one station in Tonga. India, Malaya, Fiji. *E. plantaginea* R. Br. in Burkill's list.

Tongan name: *kuta.*

The stems are used in the weaving of mats.

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Eleocharis geniculata (Linnaeus) Roemer and Schultes, Syst. Veg. 2: 150, 1817.

Stems numerous, tufted, up to 25 cm. or more long and 2 mm. in diameter, short-sheathed at base. Spikes small, several-flowered, terminal, somewhat thicker than stem, brown.

Kao; wet margin of a small alpine lake near summit above upper forest limit, alt. about 950 m., May 7, 1953, *Yuncker 15974.*

Rare in Tonga. Pantropic.

Genus Fimbristylis Vahl

Fimbristylis annua (Allioni) Roemer and Schultes var. **diphylla** (Retzius) Kükenthal, in Engler Bot. Jahrb. 56, Beibl. 125: 14, 1921.

Stems up to 50 cm. tall, longitudinally finely striate. Blades rather firm, linear, up to 5 mm. wide, commonly shorter than stem, those of involucre much smaller, scarcely exceeding inflorescence, marginally serrulate. Spikelets brown or red, ovoid, about 5 mm. long, on rays of unequal length, in terminal clusters.

Tongatapu: *Home; Moseley.*

'Eua: on dry, red, volcanic soil, in open grazing area below summit of eastern ridge, Mar. 24, 1953, *Yuncker 15443;* near summit of eastern ridge, Mar. 24, 1953, *Yuncker 15449;* in open grazing area above Fuai plantation, Apr. 6, 1953, *Yuncker 15653.*

Kao: on open rocky, alpine slope above the upper forest limit, May 7, 1953, *Yuncker 15926.*

Vava'u: *Crosby.*

Frequent throughout Tonga. Pantropic.

Fimbristylis autumnalis (Linnaeus) Roemer and Schultes var. **complanata** (Retzius) Kükenthal, in Engler Bot. Jahrb. 59: 6, 1924.

Glabrous, tufted herb, stems up to 50 cm. or more long. Blades linear, 3-5 mm. wide, basal ones somewhat shorter than stems, those of involucre usually two, shorter than or exceeding length of inflorescence. Spikelets brown, ovoid, 5 mm. or more long, in short-rayed terminal umbels.

137 Tafahi: near lower end of path to Piu 'o Tafahi, Dec. 10, 1951, *Hürlimann 401.*

Frequent, especially on the central northern islands of Tonga. Pantropic.

Scleria margaritifera Willdenow, Sp. Pl. 4: 312, 1805.

Rather stout, somewhat tufted plant, stems up to 1.5 m. tall, triangular, scabrid at angles. Leaves numerous, blades up to 30 cm. long and about 1 cm. wide or narrower, margins scabrous. Spikelets numerous, about 5 mm. long, in axillary, paniculate clusters, nutlets white or grayish lilac, globose, 2.5-3 mm. in diameter, somewhat rugose.

'Eua: on upper sea-facing terrace, in open shade, along trail to Lokupo, Mar. 27, 1953, *Yuncker 15225.*

Kao: in open area in forest, May 6, 1953, *Yuncker 15873, 15904.*

Vava'u: *Crosby;* edge of thicket-bordered grassy area at summit of Talau just west of Neiafu, May 23, 1953, *Yuncker 16140.*

Tafahi: on northeast slope of the Piu 'o Tafahi, Dec. 10, 1951, *Hürlimann 428.*

Niuatoputapu: on ridge of mountain above Vaipoa, Dec. 5, 1951, *Hürlimann 356.*

Rather frequent throughout Tonga. Australia, New Caledonia, Polynesia.

Tongan name: *mahelehele.*

FAMILY PALMAE

Genus **Pritchardia** Seemann and Wendland

Pritchardia pacifica Seemann and Wendland, Bonplandia 9: 260, 1861.

Tree with stem up to 5 m. or more tall and 30 cm. thick, bark with longitudinal fissures. Leaves fan-shaped, plicate, up to about 1 m. long, petioles stout, about as long as blade. Inflorescence large, axillary, paniculate; fruit drupelike, one-seeded, black.

Tongatapu: U.S. Exploring Expedition.

'Eua: *Lister;* on steep slope above Vaifefe, Nov. 13, 1951, *Hürlimann 271;* in thicket near shore in sandy soil, Ha'aluma, Apr. 1, 1953, *Yuncker 15607.*

Vava'u: *Crosby.*

Frequent toward the southern end of 'Eua and occasional elsewhere. Fiji and Polynesia.

[245] [824] Tongan name: *piu.* Sometimes cultivated as an ornamental.

Genus **Cocos** Linnaeus

137 245 824 **Cocos nucifera** Linnaeus, Sp. Pl., 1188, 1753.

Unbranched tree with swollen base and smooth, commonly more or less inclined trunk up to 20 m. or more tall. Leaves clustered at top, up to 4 m. or more long, pinnate, pinnae firm and coriaceous, oblong-lanceolate, long-acuminate. Flowers monoecious, in large, axillary clusters; fruit a large, one-seeded nut, enclosed in a thick, fibrous husk. Of aboriginal introduction.

C. nucifera is cultivated throughout the world in tropical countries for its many useful properties. Copra, the dried flesh of the seed, is the most important export crop of Tonga. Large plantations of coconut are located on all of the main islands. Trees also grow spontaneously outside of cultivation. 137 245 824 [439]

Tongan name: *niu*. The following varieties are recognized:

Niu kafa: fruit is large and long, but nut is very small; husk fibers are used in making a type of cordage called *kafa*. [283]
Niu kula: fruit is very small, scarcely more than 3 inches long, containing little or no liquid, cavity being filled with white pulp or jellylike substance.
Niu leka: very slow-growing variety.
Niu matakula: base of fruit where stalk joins is red.
Niu mea: fruit is yellowish in color.
Niu mealava: fruit-stalk scar has a red ring surrounding it.
Niu ta‘okave: fruits are very small, some yellow and some green.
Niu tea: fruit is pale green.
Niu ‘ui: fruit is green.
Niu ‘utongau: fruit is mostly green, husk sweet and edible.
Niu vai: fruit is very large, mostly green but sometimes yellow.

FAMILY ARACEAE

Genus **Epipremnum** Schott

Epipremnum pinnatum (Linnaeus) Engler, Pflanzenr. 37 (IV. 23B): 60, 1908. 137

High-climbing, much-branched, coarse, subherbaceous vine. Leaves alternate, ovate-oblong, acuminate, base rounded to cordate, entire, variously perforated with large holes, or larger leaves pinnately divided nearly to midrib into numerous oblong lobes, up to 40-60 cm. long. Flowers small, crowded on a cylindrical, fleshy spadix 2-3 cm. thick and 8-10 cm. long, spadix subtended by a leaflike, lanceolate spathe as long as, or longer than, spadix.

Tongatapu: in forest near sea below Fu‘amotu village, Mar. 4, 1953, *Yuncker 15172*.

‘Eua: *Lister;* in dense forested ravine north of Fuai, Mar. 19, 1953, *Yuncker 15369*.

Vava‘u: near summit of Talau, west of Neiafu, May 24, 1953, *Yuncker 16158*.

Common throughout Tonga in forested areas. Burma to the Philippines and Polynesia.

Raphidophora pertusa var. *vitiensis* Engl. in Hemsley's list.

Tongan name: *alu*.

The long slender stems (called *kaho alu*) are used in the weaving of baskets. [285] [824]

Genus **Colocasia** Schott

Colocasia esculenta (Linnaeus) Schott, Melet. Bot. 1: 18, 1832. 137 262 824

Acaulescent, tuber-forming herb. Leaves ovate-cordate, peltate, entire, acute to acuminate, of various sizes but mostly 30 cm. or more long, petiole sheathing at base. Flowers small, on a fleshy spadix surrounded by a yellowish or reddish spathe.

137 This species is of ancient introduction and is cultivated as a staple food
824 crop throughout Tonga. A large number of varieties are recognized by the
262 Tongans.

Tongan name: *talo.*

Genus **Alocasia** Necker

137 **Alocasia macrorrhiza** (Linnaeus) Schott, Oesterr. Bot. Wochenbl. 4: 409, 1854.

Large herb with stem 1 m. or more tall and up to 15 cm. or more in diameter. Leaves cordate-sagittate, glabrous, obtuse to acuminate, margins entire or wavy, up to 1 m. long and 60 cm. wide but some varieties smaller, petiole up to 1 m. or more long, sheathing at base. Flowers monoecious, on a fleshy spadix, enclosed in a greenish spathe.

Occasional in plantations. This southern Asiatic species is now widely distributed in Polynesia. The stem is sometimes used as food. [262]

[824] Tongan name: *kape*. The following varieties are recognized: *kape hina, fahenga 'uli, fahenga enge'enga.*

[247] [824] A number of varieties of *Caladium* [*C. bicolor* (Aiton) Ventenat ?] were seen as cultivated ornamentals about dwellings.

FAMILY LEMNACEAE

Genus **Lemna** Linnaeus

Lemna minor Linnaeus, Sp. Pl., 970, 1753.

Minute, floating herb, often growing in large colonies, stem elliptic, 2-3 mm. long, green above, paler or reddish beneath, functioning as a leaf, with threadlike roots. Flowers very inconspicuous.

Tongatapu: in bay of lagoon near Pea, Nov. 23, 1951, *Hürlimann 324.*

The available material of this specimen is meager and the identification is not certain. No previous report of *Lemna* from Tonga is known.

Of Old World origin, now of wide distribution.

FAMILY BROMELIACEAE

Genus **Ananas** Adanson

Ananas comosus (Linnaeus) Merrill, Interpret. Herb. Amboin., 133, 1917.

[245] The pineapple is seen occasionally in plantations, but I saw no extensive plantings.

[824] The Tongan name for the pineapple is *faina*. The following varieties are recognized: *faina*, fruit of medium size, the leaf margins spiny; *faina ha'amoa*, fruit large and not as sweet as other varieties, the leaf spiny only toward the apex; and *faina 'initia*, the leaves at the top of the fruit red.

Genus **Rhoeo** Hance

137 **Rhoeo discolor** (L'Héritier) Hance, in Walpers, Ann. Bot. Syst. 3: 660, 1852.

Low herb with short, thick, creeping, fleshy stems ascending up to 30 cm. Leaves numerous, narrowly lanceolate, entire, acuminate, dark green above, purple beneath, up to 30-40 cm. long and 4-6 cm. wide, fleshy, petiole about 1 cm. long, sheathing stem. Flowers small, white, about 1 cm. wide, several, in axillary, racemose clusters, surrounded by two large, purplish, boat-shaped bracts.

Tongatapu: on coral rocks near sea below Niutoua village, Mar. 2, 1953. *Yuncker 15129.*

824 247 764 Found throughout Tonga. Often planted in cemeteries, from where it becomes established as an escape. A tropical American species now widely grown as an ornamental in warm climates.

Genus **Zebrina** Schnizlein

Zebrina pendula Schnizlein, Bot. Zeit. 7: 868. 1849.

Tender, decumbent herb with weak, semi-prostrate, creeping stems. Leaves alternate, ovate-lanceolate, acute, 3-6 cm. long, purple beneath, silvery green above with purple stripes, petiole tubular and sheathing stem. Flowers reddish or purplish, small, short-pedicellate, in few-flowered cymose clusters enclosed by sheathing bracts.

Tongatapu: along trail between Ha'akame village and sea, Mar. 12, 1953, *Yuncker 15275.*

A Mexican plant now of wide distribution as an ornamental; occasional to frequent as a weed in plantations and waste areas throughout Tonga.

FAMILY LILIACEAE

Genus **Dianella** Lamarck

Dianella ensifolia (Linnaeus) de Candolle, in Redouté, Liliacées, 1, pl. 1, 1802.

Rather coarse, short-stemmed, herbaceous plant. Leaves distichous, linear, swordlike, up to 50 cm. or more long and 2 cm. wide, gradually long-acuminate, finely parallel-nerved, narrowing to a clasping petiolar base. Flowers blue to white, small, in terminal panicles up to 60 cm. or more long.

Tongatapu: in sandy soil under trees and shrubs near beach, Sopu, west of Nuku'alofa, May 30, 1953, *Yuncker 16212.*

'Eua: *Lister.*

Kao: in rocky soil in open forest on upper slope, alt. about 600 m., May 6, 1953, *Yuncker 15893.*

Vava'u: *Crosby;* along upper rim of limestone coastal cliff above Leimatua, May 20, 1953, *Yuncker 16081.*

Occasional throughout Tonga in thickets. India and China to Malaya, Formosa, Australia, and Polynesia.

Recorded as *D. nemorosa* Lam. in Burkill's list.

Tongan name: *akahele.*

? **Dianella intermedia** Endlicher, Prodr. Fl. Norf., 28, 1833.

Short-stemmed, herbaceous plant. Leaves linear, grasslike, distichous, up to 50 cm. or more long and 1 cm. wide, finely parallel-nerved, clasping stem at base. Flowers whitish, small, in large, terminal, paniculate clusters.

Tongatapu: *Nelson;* in open bush on sand near shore northwest of Hofoa, Oct. 30, 1951, *Hürlimann 86.*

'Eua: on limestone rocks in open vegetation, border of cliff near center of eastern ridge, Nov. 9, 1951. *Hürlimann 212.*

Occasional. New Zealand, Norfolk Island, Fiji, Society Islands.

Tongan name: *afuafu.*

The taxonomy of this genus is complex and the identifications are tentative.

Genus **Cordyline** Commerson

Cordyline terminalis (Linnaeus) Kunth, Berlin Akad., Abh., 30, 1820.

Small tree with slender stem up to 3 m. or more tall. Leaves closely spirally clustered near end of stem, elliptic-lanceolate or oblong-lanceolate, acuminate, base acute, up to 60 cm. or more long and 15 cm. wide, smooth, entire, finely pinnately nerved, petiole deeply canaliculate, clasping stem. Flowers pink or red, small, numerous, in large, terminal, paniculate clusters; fruit fleshy, globose, yellow or reddish.

Tongatapu: *Moseley;* in coastal forest near Fatai, Oct. 30, 1951, *Hürlimann 55;* in thicket near sea, near Vaini, Feb. 26, 1953, *Yuncker 15059;* in clearing between Fatai village and sea, Mar. 10, 1953, *Yuncker 15262.*

'Eua: *Lister;* in thicket along trail between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15483.*

Kao: near the upper margin of slope forest, May 6, 1953, *Yuncker 15954.*

Vava'u: *Crosby.*

Frequent throughout Tonga. Presumably of Malaysian origin; now widely distributed in Polynesia.

Tongan names: *si, si matale'a.*

The leaves are used to wrap fish and other foods, and the roots may be eaten in times of food scarcity. [251] [261] [824]

Genus **Asparagus** Linnaeus

Asparagus plumosus Baker, Linn. Soc. Bot., Jour. 14:613, 1875.

Climbing, vinelike plant with sub-woody stems bearing small, recurved spines, branches forming a horizontal, flattened, fanlike frond. Cladophylls numerous, filiform, fascicled, mostly less than 1 cm. long. Flowers small, white, in few-flowered clusters; berry black.

137 'Eua: ravine of Lakatoha River near Ohonua, Nov. 10, 1951, *Hürlimann 236;* same location, Apr. 2, 1953, *Yuncker 15613.*

Lifuka: climbing in shrubbery of seaside thicket, north of Pangai village, Apr. 24, 1953, *Yuncker 15704.*

Occasional to frequent in thickets throughout Tonga. A south African plant now widely disseminated in warm countries.

Tongan name: *taupo'ou.*

Genus **Smilax** Tournefort

Smilax vitiensis (Seemann) A. de Candolle, in DC. Monogr. Phanerog. 1:204, 1878.

Rather slender, woody vine. Leaves alternate, round-ovate, abruptly short-pointed, base rounded, cordate, palmately 5-7-nerved, up to 15 cm. long and 15 cm. wide, petiole up to 5 cm. or more long, with a pair of stipular tendrils. Flowers greenish, on slender pedicels up to 2 cm. long, in axillary, pedunculate umbels, peduncle up to 8 cm. or more long.

'Eua: climbing in trees, forest above Fuai plantation, near center of island, Mar. 21, 1953, *Yuncker 15401;* in forest on seaward terrace along trail descending to Lokupo, Mar. 27, 1953, *Yuncker 15512.*

Occasional on 'Eua. Also in Fiji.

Tongan name: *matafu'i.*

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824
247
The cultivated garden asparagus (*Asparagus officinalis* Linnaeus var. *altilis* Linnaeus), onions (*Allium cepa* Linnaeus), and leeks (*Allium porrum* Linnaeus) are occasionally cultivated as vegetables. *Eucharis grandiflora* Planchon and Linden is a favorite ornamental species.

FAMILY AMARYLLIDACEAE

Genus **Zephyranthes** Herbert

Zephyranthes candida Herbert, Curtis's Bot. Mag., pl. 2607, 1826.

Small, bulbous plant with flat, narrow, grasslike leaves up to 20-30 cm. long. Flowers funnel-shaped, white or slightly rose-tinged on outside, up to 4 or 5 cm. long, solitary on a hollow scape about as long as leaves.

Tongatapu: in roadside ditch near Nuku'alofa, Mar. 7, 1953, *Yuncker 15218.*

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764
824
An ornamental planted about dwellings and in cemeteries but escaping to roadsides and waste areas. A South American species now widely grown as an ornamental in warm countries.

Tongan name: *feu'u.*

Genus **Crinum** Linnaeus

Crinum asiaticum Linnaeus. Sp. Pl., 292, 1753. 137

Coarse, bulbous herb. Leaves numerous, oblong, straplike, acute, up to 2 m. long or more and 25 cm. wide, fleshy, clasping at base. Flowers numerous, at top of fleshy scape, white, fragrant, perianth tube up to about 10 cm. long, filaments white, styles purplish.

Niuatoputapu: in grassy area near old well in Hihifo, Dec. 7, 1951, *Hürlimann 399*.

Occasionally cultivated as an ornamental throughout Tonga. A southern Asiatic species now widely cultivated in warm climates. [247] [824]

Crinum pedunculatum R. Brown, Prodr. Fl. Nov. Hollandiae, 297, 1810.

Fleshy, bulbous herb. Leaves fleshy, numerous, up to 1 m. or more long and 10 cm. wide. Flowers numerous, umbellate at top of stout, solid, fleshy scape, perianth tube green, up to 10 cm. long, with linear, white segments up to 5 cm. long.

'Eua: *Lister*.

An Australian species now widely cultivated as an ornamental. [247] [824]

Genus **Furcraea** Ventenat

? **Furcraea gigantea** Ventenat, Soc. Philom., Bull. 1: 65, 1793.

Coarse, short-stemmed plant. Leaves nearly flat, spreading rosette fashion from short stem, linear-lanceolate, up to 1 m. or more long, fleshy, margin armed with strong, recurved teeth, apex acuminate and ending in a short, sharp spine. Flowers white, commonly replaced by bulbils, in large, terminal, paniculate clusters.

Tongatapu: forming a colony along side of trail below Ha'akame village, Mar. 12, 1953, *Yuncker 15287*.

Introduced for the fibers obtained from the leaves and used in cordage. Now established locally. [283] [824]

Tongan name: *faumalila*.

FAMILY TACCACEAE

Genus **Tacca** Forster

Tacca leontopetaloides (Linnaeus) O. Kuntze, Rev. Gen. Pl. 2: 704, 1891.

Herb, up to 50 cm. or more tall. Leaves radical, large, palmately three-parted, each division in turn deeply lobed and divided into acuminate lobes and teeth, petioles up to 60 cm. or more long. Flowers pendent, greenish, numerous, in umbellate clusters at top of a hollow, bracteate scape sometimes up to about 1 m. tall; fruit globose, ribbed, fleshy, yellowish when ripe, crowned with withered floral parts. Tubers up to 8-10 cm. in diameter, sometimes larger under cultivation.

Tongatapu: *Moseley;* in calcareous soil in thicket near shore, Sopu, Feb. 25, 1953, *Yuncker 15004*.

'Eua: in border of pastured land near center of island, Apr. 5, 1953, *Yuncker 15639*.

137 Vava'u: *Crosby.*

Tafahi: in coconut plantation on coastal plateau between Tafahi and Tafe, Dec. 13, 1951, *Hürlimann 510.*

Niuatoputapu: in bushy second-growth forest on volcanic ridge above Vaipoa, Dec. 5, 1951, *Hürlimann 363.*

Frequent throughout the group. From tropical Africa and southern Asia to Australia, the Philippines, and Polynesia.

For an informative discussion of this species, see Merrill in the Journal of the Arnold Arboretum (26: 85-92, 1945).

[287] [824] [381] Tongan name: *mahoa'a.* The tubers furnish starch used as an adhesive in the manufacture of tapa, or bark cloth.

FAMILY DIOSCOREACEAE

Genus **Dioscorea** Plumier

Dioscorea alata Linnaeus, Sp. Pl., 1033, 1753.

Herbaceous or somewhat woody, high-climbing vine with four-angled and winged stems, often bearing small, axillary tubers. Leaves opposite, ovate-cordate, attenuately acuminate, entire, up to 12 cm. or more long, palmately 9- to 11-nerved, petiole nearly as long as blade. Staminate flowers small, greenish, numerous in narrow, paniculate, axillary clusters, up to 30 cm. or more long.

Tongatapu: *Cook.*

Vava'u: *Crosby.*

[262] [824] Cultivated throughout Tonga for its edible tubers, which form an important part of the diet of the Tongan people. A large number of varieties are recognized by the Tongans. A native of the Old World tropics, now of pantropic distribution.

Tongan name: *'ufi.*

Dioscorea bulbifera Linnaeus, Sp. Pl., 1033, 1753.

Herbaceous, glabrous, high-climbing, twining vine. Leaves alternate, oval-ovate to suborbicular, abruptly acuminate, base deeply and obtusely cordate, up to 20 cm. or more long, palmately 7 to 11 or more nerved, petioles commonly half to as long as blade, twisted at base, green or reddish aerial tubers up to 5 cm. or more in diameter often present in the axils. Flowers small, in long, slender, spikelike clusters in axillary fascicles.

Tongatapu: *Cook;* in thicket near Navutoka village, Feb. 27, 1953, *Yuncker 15088.*

'Eua: in thicket along trail near center of island, Mar. 20, 1953, *Yuncker 15383.*

Vava'u: *Crosby.*

Tafahi: ridge of the Piu 'o Tafahi, Dec. 10, 1951, *Hürlimann 425.*

Niuatoputapu: along road between Vaipoa and Falehau, Jan. 2, 1953, *Hürlimann 650.*

Frequent throughout Tonga.[1] A native of the tropics of the Eastern Hemisphere extending to Polynesia.

D. sativa L. in Hemsley's and Burkill's lists.

Tongan name: *hoi.*

The tubers are said to be poisonous unless properly cooked and are not used as food. [262/824]

Dioscorea esculenta (Loureiro) Burkill, Gard. Bull. Straits Settlem. 1: 396, 1917.

Strong, high-climbing, more or less prickly-armed, subwoody, pubescent, twining vine with large, edible root tubers. Leaves alternate, ovate-cordate to suborbicular or reniform, attenuately acuminate, basal sinus broad, obtuse, up to 15 cm. or more long, woolly-pubescent. Flowers green, 4-5 mm. in diameter, in slender, axillary spikes up to 50 cm. long.

Introduced and cultivated for its edible tubers. From India to the Philippines and Polynesia. [262/824]

Dioscorea pentaphylla Linnaeus, Sp. Pl., 1032, 1753.

Strong, twining, pubescent, somewhat prickly, herbaceous vine with more or less angular stems. Leaves alternate, palmately 3- to 5- to 7-foliate, leaflets elliptic-lanceolate, attenuately acuminate, entire, up to 15 cm. or more long, with numerous, small, oblong, translucent lines, petiolules up to 1 cm. long. Flowers yellowish white, slightly fragrant, in axillary panicles longer than leaves.

Vava'u: in thicket at summit of Talau, west of Neiafu, May 24, 1953, *Yuncker 16157.*

Niuafo'ou: on wall of great crater above Futu, Jan. 7, 1952, *Hürlimann 659.*

Occasional in thickets. From India to the Philippines and Polynesia.

Tongan name: *lena.*

The tuber is edible but of poor quality and is eaten only in times of food shortage. [261/824]

FAMILY IRIDACEAE

Genus **Belamcanda** Adanson

Belamcanda chinensis (Linnaeus) de Candolle, in Redouté, Liliacées 3, pl. 121, 1802.

Short-stemmed herb. Leaves somewhat tufted, up to 50 cm. or more long and 4 cm. wide, two-ranked, ascending, narrowly lanceolate, acuminate, parallel-nerved, the nerves obvious. Flowers short-lived, opening one at a time, about 5 cm. wide, yellow outside, reddish-yellow with red spots within, in a large, many-flowered, di- or trichotomously branched terminal inflorescence; fruit about 2-3 cm. long, seeds globose, black, glossy.

Tongatapu: margin of cemetery near sea below Ha'akame village, Mar. 12, 1953, *Yuncker 15278.*

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[1] /Dioscorea bulbifera Linnaeus -- Analyst/

137 [247] [764] [824] Cultivated[1] as an ornamental in villages and cemeteries. A native southeastern Asiatic species now widely distributed as an ornamental in warm countries.

FAMILY MUSACEAE

Genus Musa Linnaeus

Musa nana Loureiro, Fl. Cochinchinensis. 644, 1790.

I was unable to determine with certainty the presence of this dwarf Chinese banana, but it was claimed to grow in Tonga. If so, it is probable that some of the Tongan names listed under the following species refer to it.

Musa paradisiaca Linnaeus subspecies **normalis** O. Kuntze, Rev. Gen. Pl. 2: 692, 1891.

137 262 824 [252] The fruit of this subspecies, commonly known as the plantain, is usually cooked before eating. The Tongan name for this subspecies is *hopa*. The following varieties are recognized by the Tongans.

Fetau kula: fruit is round.
Fetau ulu'ikuma.
Lehia: bunch bears three or four hands of very large fruits.
Maholi hina.
Maholi 'uli.
Misipeka: small bunches of red fruits.
Pikipiki hina: fruit is small, white, the flesh firm.
Puko: small bunches of fruit nearly as large as the *lehia* variety.
Putalinga kula: stem is large, red, the bunches large, the fruit the size of those of the *puko* variety.
Putalinga puku.
Tateau.
Tokoni vai: large bunches of hard-fleshed fruit.
Tu'utu'ukoutala.
Uhotaha.
Vaivai hako: fruit is medium-sized, long, round, curved.
Vaivai puki.

Musa paradisiaca Linnaeus subspecies **sapientum** (Linnaeus) O. Kuntze. Rev. Gen. Pl. 2: 692, 1891.

[252] The fruit of this subspecies, one of the bananas of commerce, is generally eaten raw. The following varieties are recognized by the Tongans.

Mahimahi: stem is short to medium, the bunches and fruit small.
Mamae: leaves are purplish, the fruit white and short.
Pata lahelahe: stem is medium tall, the fruit green with whitish bloom.
Pata tonga: stem is medium tall, the fruit green, somewhat ribbed, larger than variety *pata lahelahe.*
Siaine fisi: stem is tall, with large bunches of large fruits.
Siaine ha'amoa: stem is medium tall, the fruits and bunches large.
Siaine initia: stem is tall and red, with large clusters of red fruits.
Siaine tonga: stem is short, with short clusters of short fruits.

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[1] /Belamcanda chinensis (Linnaeus) de Candolle -- Analyst/

It is probable that some of the above varieties are incorrectly placed as to 137
subspecies, as it was not possible to determine their exact relationship. So far 262
as I know, no wild species of *Musa* occur in Tonga. Plantains and bananas 824
are grown extensively throughout the group and are an important item in the
diet of the Tongans. A comparatively large number of bunches are shipped [439]
annually to the New Zealand markets.

FAMILY ZINGIBERACEAE

Genus **Zingiber** Adanson

Zingiber zerumbet (Linnaeus) J. E. Smith, Exot. Bot. 2: 103, pl. 112, 1804.

Herbaceous plant with pubescent, leafy branches rising to about 1 m. tall from a thickened, fleshy rhizome. Leaves alternate, distichous, entire, oblong-elliptic or lanceolate, acuminate, clasping the stem at the base, up to about 30 cm. long and 5 cm. wide, pubescent beneath. Flowers white or pale yellow, in a large, bracteate, cone-like spike at top of a leafless scape up to about 30 cm. tall, bracts rounded, overlapping, becoming red.

Tongatapu: in a low wet area near Nualei, Mar. 9, 1953, *Yuncker 15221.*

'Eua: in thicket at margin of forest near summit of central part of eastern ridge. Mar. 24, 1953, *Yuncker 15455.*

Vava'u: *Crosby.*

Tafahi: at summit of Piu 'o Tafahi, Dec. 11, 1951, *Hürlimann 459.*

Niuatoputapu: on southward slope of mountain ridge opposite Vaipoa, Dec. 25, 1951, *Hürlimann 636.*

Frequent in thickets throughout the group. An Asiatic species now widely distributed in warm countries.

Tongan name: *angoango.*

The rhizome is used in preparing medicines. [278]
[824]

Genus **Hedychium** Koenig

Hedychium coronarium Koenig, Retz. Observ. Bot. 3: 73, 1783.

Erect herb, stems up to 1 m. tall from a stout rootstock. Leaves distichous, oblong-lanceolate to lanceolate, acuminate, up to 50 cm. more long and 10 cm. wide, petiole short clasping stem with an elongated sheathlike portion. Flowers very fragrant, white turning yellow, perianth tube slender, up to 6 or 8 cm. long, in dense, terminal, bracteate spikes, bracts oblong to obovate or lanceolate, imbricate.

Tongatapu: in moist area along trail below Fatai village, Mar. 10, 1953, *Yuncker 15263.*

'Eua: in Pangai village, Mar. 25, 1953, *Yuncker 15488.*

Common in villages as an ornamental and occasionally as an escape. An [247]
Indian species now widely distributed in warm countries as an ornamental. [824]

Tongan name: *tevunga.*

The aromatic parts of this plant are used to scent oil. [303]
[824]

Genus **Curcuma** Linnaeus

137 **Curcuma longa** Linnaeus, Sp. Pl., 2, 1753.

Erect, leafy, herbaceous plant with aromatic, fleshy rootstock. Leaves elliptic-oblong, distichous, acuminate, finely pinnately nerved, petiole about as long as blade, sheathing at base. Flowers several, yellowish, in axils of greenish bracts forming a dense, cone-like or cylindric head at end of leafless peduncle.

Tongatapu: in swampy area below Nualei village, Mar. 9, 1953, *Yuncker 15248.*

'Eua: in deep forest on ridge above sea-facing terraces above Lokupo, Mar. 27, 1953, *Yuncker 15537.*

Vava'u: *Crosby.*

Occasional throughout Tonga. An Indian species now widely disseminated in warm countries.

Tongan name: *ango.*

[386] [252] [278] [824] The rootstock provides a yellow dye and the leaves are used to wrap fish and in the preparation of medicines.

FAMILY CANNACEAE

Genus **Canna** Linnaeus

Canna indica Linnaeus, Sp. Pl., 1, 1753.

Smooth, erect, rhizomatous herb, up to about 1.5 m. tall. Leaves oblong-ovate or lanceolate, entire, acute to acuminate, with long, basal, petiolar part sheathing stem, blade up to 50 cm. or more long and 20-25 cm. wide, pinnately nerved, lateral nerves slender and numerous. Flowers irregular, medium to large, showy, red or yellow, in terminal racemose or paniculate clusters; fruit a warty, bristly capsule, seeds globose, hard, black.

Tongatapu: forming large patches in low moist areas near Vaini, Feb. 26, 1953, *Yuncker 15060.*

'Eua: in low moist area between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15472.*

Vava'u: *Crosby;* in waste areas near northwestern coastal cliff, May 25, 1953, *Yuncker 16159.*

[247] [824] Common in low moist areas throughout Tonga. A tropical American plant now of pantropic distribution. A number of horticultural forms are grown for ornament.

Tongan name: *misimisi.*

FAMILY MARANTACEAE

Genus **Maranta** Linnaeus

Maranta arundinacea Linnaeus, Sp. Pl., 2, 1753.

Erect, slender, glabrous, somewhat dichotomously branched herb, up to about 1 m. tall, rootstock fleshy. Leaves rather thin, ovate-oblong, acuminate, base rounded, blade up to 20-25 cm. long, finely and closely pinnately nerved, petiole winged, clasping. Flowers white, about 2 cm. long, in loose, terminal, few-flowered clusters. 137

Tongatapu: in low wet area near Fatai village, Mar. 10, 1953, *Yuncker 15259.*

'Eua: in thicket near Ha'aluma, Apr. 1, 1953, *Yuncker 15606.*

Found about villages, occasionally adventive. A tropical American species of pantropic distribution.

Tongan name: *misimisi koka'anga.*

The starchy rootstocks[1] are used in preparing a paste employed in the manufacture of bark cloth and sometimes eaten. [287] [262] [824]

FAMILY ORCHIDACEAE

Orchid identifications are by Charles Schweinfurth.

Genus **Habenaria** Willdenow

Habenaria sp.

Short, erect, leafy, glabrous herb. Leaves oblong-lanceolate, acuminate, sheathing stem at base, up to 15 cm. long and 1-1.5 cm. wide, parallel-nerved, with midrib more prominent than lateral nerves. Flowers several, sessile or subsessile, in a terminal spicate inflorescence; capsule about 8 mm. long.

'Eua: in moist forest floor humus, near center of island, Mar. 21, 1953, *Yuncker 15404.* This specimen is poor and specific determination is not possible.

Infrequent.

Genus **Spiranthes** L. C. Richard

Spiranthes sinensis (Persoon) Ames, Orchidaceae 2: 53, 1908.

Erect, glabrous, terrestrial, slender herb, up to 30 m. or more tall. Leaves grasslike, up to 15 cm. or more long and 4-5 mm. wide, acuminate, clasping stem at base, parallel-nerved. Flowers 3-4 mm. long, commonly rose-colored, numerous, in a terminal, bracteate, spikelike spiral raceme.

Lifuka: in shady thicket near southern end of island, Apr. 28, 1953, *Yuncker 15775.*

Infrequent. Southern and eastern Asia, Malaya, Australia, New Zealand, and Polynesia.

Genus **Corymborchis** Thouars

Corymborchis veratrifolia (Reinwardt) Blume, Fl. Jav. Orch., 105, pls. 42E, 43, fig. 1, 1858.

Rather coarse, erect, terrestrial herb, up to 1 m. or more tall. Leaves broadly or narrowly elliptic, acuminate, with narrowed base clasping stem, up to 30 cm. or more long and 8 to 11 cm. wide, parallel-nerved, six to eight of the nerves being prominent, intermediate nerves very slender. Flowers 1.5-3 cm. long, pedicellate, numerous, in loose, axillary panicles up to 15 cm. or more wide.

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[1] /Maranta arundinacea Linnaeus -- Analyst/

Vava'u: *Crosby;* near upper rim of steep seaside cliff above Leimatua, May 30, 1953, *Yuncker 16060.* 137

Niuafo'ou: near upper edge of recent lava flow on way to upper rim of main crater, May 16, 1953, *Yuncker 15993;* on shore of great lake in sector of Futu, Jan. 7, 1952, *Hürlimann 667.*

Niuatoputapu: on mountain ridge above Vaipoa, Dec. 5, 1951, *Hürlimann 355.*

Occasional throughout the group but abundant on Niuafo'ou. From Indo-Malaysia to Polynesia and now in cultivation in most tropical countries.

Tongan name: *toa.*

The bark is used in medicines and the hard, durable wood is a favorite in the construction of houses, the manufacture of tool handles, and so forth. 278 342 412 824

FAMILY PIPERACEAE

Genus Piper Linnaeus

Piper latifolium Linnaeus f., Suppl. Pl. Emendanda, 468, 1781.

Shrub, up to 3 m. or more tall. Leaves suborbicular, shortly acute, base rounded-truncate or cordate, up to about 10 cm. wide or sometimes much larger, glabrous, palmately 11-12-nerved, petiole up to 6 cm. in length, vaginate-winged to near blade. Spikes multiple, axillary, up to 10 cm. or more long and 4-6 mm. in diameter, floral bracts round-peltate, flowers dioecious.

Tongatapu: *Forster; Moseley.*

I found no specimens of this species, and I suspect that the ones collected by Forster and by Moseley, as reported by Hemsley, are *P. puberulum* (Bentham) Bentham. Not having these specimens available at the present time, it is not possible to determine their identity. *P. latifolium* is said to occur from the Society Islands westward to the New Hebrides, although it appears to be absent from Samoa and Fiji.

Piper methysticum Forster f., De Plant. Esculent., 76, 1786.

Shrub with thick, woody rhizome, up to 3 m. or more tall, glabrous, nodes swollen. Leaves round-ovate, short-acuminate, base deeply cordate, up to 20 cm. or more long and 15-20 cm. wide, palmately 9-13-nerved, nerves minutely puberulent beneath, petiole up to 3 cm. long, vaginate at base. Spikes leaf-opposed, solitary, up to 5 or 6 cm. long, greenish white.

Tongatapu: *Home.*

'Eua: *Lister;* cultivated at Fuai plantation near center of island, Mar. 28, 1953, *Yuncker 15541.*

Vava'u: *Crosby;* along trail on way to summit of Talau, west of Neiafu, May 23, 1953, *Yuncker 16149.*

Of ancient introduction. Aside from one or two plantings of less than an acre each, all of the plants noted were occasional specimens about villages or borders of plantations, and the like.

76: Yuncker N-4,5 (1953) 1959 19 Tonga OU9

137 Tongan name~~s~~[1] *kava*.

[274] [824] The roots are pulverized and used in the preparation of the beverage known as kava.

Piper puberulum (Bentham) Bentham, in Seemann, Fl. Vit., 262, as synonym, and pl. 75, 1868.

Shrub 1-3 m. tall, stems nodose. Leaves alternate, elliptic to rounded-ovate, acuminate, base from acute to shallowly cordate, very variable in size, up to 15 cm. long and as wide, palmately 7-9-nerved, main nerves branching upward, the petiole 3 cm. or less long, vaginate-winged to middle or above. Spikes solitary, axillary, up to 15 cm. or more long; fruit fleshy and red when mature. (The following two varieties occur in Tonga.)

Piper puberulum var. **puberulum.**

Lower surface of leaf blades puberulent.

Kao: on rocky slope in thin forest, May 6, 1953, *Yuncker 15874*. Seemingly rare in Tonga although rather frequent in Fiji.

Piper puberulum var. **glabrum** (C. de Candolle) A. C. Smith, Jour. Arnold Arboretum **24**: 356, 1943.

Leaf blades glabrous on both sides.

Tongatapu: common in thickets about Vaini village, Feb. 26, 1953, *Yuncker 15063*; in thicket near coast below village of Navutoka, Feb. 27, 1953, *Yuncker 15096*.

'Eua: in thicket above Fuai plantation, Mar. 20, 1953, *Yuncker 15370*; on limestone margin of sinkhole in forest near center of island, Mar. 18, 1953, *Yuncker 15323*.

Vava'u: margin of open forest above Leimatua village, May 18, 1953, *Yuncker 16024*; in thicket near upper rim of seaside limestone cliff along northwestern side of island, May 25, 1953, *Yuncker 16163*.

This variety is very common throughout Tonga, often forming extensive colonies in open forests or in partial shade. It is presumed that the specimens collected on Tongatapu by Home and on 'Eua by Lister (as reported by Hemsley) and by Crosby on Vava'u (as reported by Burkill) are this variety. Also in Fiji and Samoa. For an extensive discussion of this and other Pacific species of *Piper* see A. C. Smith (Jour. Arnold Arboretum **24**: 347-361, 1943).

P. macgillivrayi C.DC. in Hemsley's and Burkill's lists.

Tongan name: *kavakava'uli*.

[278] [824] The leaves are used in preparing medicines.

Genus **Peperomia** Ruiz and Pavon

Peperomia leptostachya Hooker and Arnott, Bot. Beechey Voy., 96, 1832.

Decumbent-ascending, pubescent, succulent herb. Leaves opposite or more commonly in whorls of three, oval to obovate, usually acute at both ends, up to 5 or 6 cm. long and 2-3 cm. wide, palmately five-nerved, petiole up to 1 cm. long. Spikes slender, axillary and terminal, up to 10 cm. or more long; fruit scarcely 1 mm. long, globose-subobovoid, viscid.

[1] /Piper methysticum -- Analyst/

137 our plant represent *C. paniculata* (Endlicher) Planchon, originally from Norfolk Island but often accredited with a wide distribution in the Pacific. The Niue plant which I listed (B. P. Bishop Mus., Bull. 178: 45, 1943) as *C. paniculata* seems closer to the Fijian *C. harperi* Horne. This is perhaps also the closest relative to the Tongan plant, represented further by a U.S. Exploring Expedition specimen (US 206851) from Tongatapu, but the identity of my material must await a study of the genus throughout the Pacific. (See A. C. Smith, Torrey Bot. Club. Bull. **70**: 535-537, 1943, for notes on the two species from Fiji.)

Genus **Trema** Loureiro

Trema amboinensis (Willdenow) Blume, Mus. Bot. Lugd.-Bat. **2**: 61, 1856.

Tree, up to 7-8 m. tall. Leaves two-ranked, alternate, oblong-ovate to lanceolate, acuminate, base cordate, up to 15 cm. long and 5 cm. wide, scabrid above, soft-pubescent beneath, finely serrate, palmately three-nerved, midrib strongly branching upward, petiole about 1 cm. long. Flowers very small, numerous, in dense, pubescent, axillary, cymose clusters.

Tongatapu: *Graeffe;* in old clearing between Fatai village and the sea, Mar. 10, 1953, *Yuncker 15252.*

Vava'u: *Crosby.*

Occasional. Southeastern China to Australia and eastward to Polynesia.

Given as *Sponia ambrynensis* [*amboinensis*] Decne. in Burkill's list.

[278] [824] Tongan name: *mangele.* The leaves are used in preparing medicines.

Trema orientalis (Linnaeus) Blume var. **viridis** Lauterbach, Engler Bot. Jahrb. **50**: 321, fig. 2, D, 1913.

Small to medium-sized tree, or sometimes a shrub, with reddish bark and finely pubescent branches. Leaves alternate, ovate-lanceolate, acuminate, base shallowly and somewhat obliquely cordate, scabrous, crenately toothed, up to 9 cm. or more long and 4-5 cm. wide, palmately three-nerved, midrib branched upward, petiole about 1 cm. long. Flowers small, greenish, in small, axillary cymes.

'Eua: in forested area near sea, vicinity of Ha'aluma, Apr. 1, 1953, *Yuncker 15604.*

Nomuka: in thicket along road encircling island, Apr. 30, 1953, *Yuncker 15837.*

Lifuka: in clearing near eastern end of island, Apr. 27, 1953, *Yuncker 15762.*

Kao: in thicket near lower margin of slope forest, *Yuncker 15938.*

Niuatoputapu: northern slope of mountain range above Vaipoa, Dec. 27, 1951, *Hürlimann 637.*

Frequent in thickets throughout Tonga. Other Pacific islands.

Tongan name: *mangele.*

[278] [824] The leaves are used in medicines.

The species of *Trema*, as represented in Tonga, are separated with difficulty, and it is possible that only one species occurs in the Fiji-Tongan area. In addition to the two given above, Hemsley reported *T. discolor* B. and H., based on a Tongatapu collection by Moseley. It is believed likely that this collection represents one of the two species given, probably *T. orientalis*. 137

FAMILY MORACEAE

Genus **Morus** Linnaeus

Morus alba Linnaeus, Sp. Pl., 986, 1753.

Shrub or small tree, up to 5 or 6 m. tall. Leaves ovate, acute, base truncate or cordate, toothed and sometimes lobed, nearly glabrous, three-nerved from base, midrib branched upward, 10-12 cm. or more long and 7-8 cm. wide, petiole slender, 3-4 cm. long. Flowers small, in short, dense, headlike, axillary, pedunculate clusters; fruit up to 2 cm. long, fleshy, edible, purple when mature.

Tongatapu: in thicket between village of Fatai and sea, Mar. 10, 1953, *Yuncker 15255*.

Infrequent in Tonga. A native of tropical Asia, now widely distributed in temperate and warm countries.

Tongan name: *fuamelie*.

Genus **Broussonetia** L'Héritier

Broussonetia papyrifera (Linnaeus) Ventenat, Tabl. Regn. Veg. 3: 547, 1794.

Small tree or shrub, up to 8 m. tall, with densely hairy branches and milky latex. Leaves alternate, scabrous above, velvety beneath, ovate, sharply acuminate, base cordate, serrate, entire or often lobed, up to 18 cm. or more long and 15 cm. wide, petioles up to 6 cm. or more long. Flowers small, in axillary clusters; fruit club-shaped, pulpy.

Tongatapu: in old plantation near Lavengatonga Village, Mar. 6, 1953, *Yuncker 15179*.

'Eua: near Pangai village, Mar. 25, 1953, *Yuncker 15471*.

Vava'u: *Crosby*.

Of ancient introduction, now more or less naturalized throughout Tonga. An eastern Asiatic species now widely introduced throughout the Pacific islands area.

Tongan name: *hiapo*.

The fibrous bark is used to make tapa, or bark cloth. 287 824

Genus **Artocarpus** Forster

Artocarpus altilis (Parkinson) Fosberg, Washington Acad. Sci., Jour. 31: 95, 1941.

Medium to large, round-topped tree, latex abundant, milky. Leaves alternate, up to 60 cm. or more long and 30 cm. wide, rather thick, deeply pinnately lobed, lobes acuminate

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137 or, in some varieties, entire or shallowly divided with two or four short, triangular lobes, petioles short. Male flowers in large, dense, yellow, club-shaped, spikelike clusters, female flowers in globose to oval, headlike clusters which develop into round or oval fruits 15 cm. or more thick.

Frequent in plantations and about dwellings throughout Tonga. A Malaysian species now cultivated throughout the Pacific islands area.

Tongan name: *mei.*

137 The cooked fruit is an important item in the diet of the Tongans, who
262 distinguish the following varieties:

824 *Aveloloa:* leaf is of medium size, the fruit oval and many-seeded.
Avenonou: fruit is smaller than that of *aveloloa.*
Kea kulufau: fruit is very large and round.
Kea ma'ama'a: fruit is oval, prickly or scabrous.
Lautolo: fruit is of medium size, round: leaves deeply pinnately lobed.
Ma'ofala: fruit is very small, oval.
Maopo: fruit is large, oval, smooth; leaves toothed.
Puou: leaves are lobed, the fruit medium-sized, round.
Vahivahi: leaves are rather deeply lobed, the fruit medium-sized, round.

137 This species has more frequently been known as *Artocarpus incisa* (Thunberg) Linnaeus f. or *A. communis* Forster. For a comment on the status of Parkinson's original description of this and other questionably proposed species, see Merrill (Chron. Bot. **14**: 359 ff., 1954).

Artocarpus integra (Thunberg) Merrill, Interpret. Herb. Amboin., 190. 1917.

Tree, up to 12-15 m. tall. Leaves alternate, elliptic-oblong to obovate, short-acuminate, base acute, entire or sometimes three-lobed, up to 15 cm. or more long. Male flowers in terminal or axillary spikelike clusters, up to 8 cm. long and 2.5 cm. in diameter, female flowers in globose or oblong heads borne on trunk or older branches; fruit green, oblong, up to 50 cm. or more long.

Vava'u: *Crosby.*

Occasional. An Asiatic species now widely distributed in warm countries. *A. integrifolia* L. in Burkill's list.

Tongan name: *mei.*

[262]
[824] The fruit is used as food.

Genus Antiaris Leschenault

Antiaris bennettii Seemann, Bonplandia **10**: 3, pl. 7, 1862.

Medium-sized tree, branchlets and petioles pubescent glabrescent. Leaves ovate-oblong or elliptic-oblong, acuminate, base inequilaterally subcordate, glabrous, pinnately nerved, lateral nerves submarginally loop-connected, petiole comparatively short. Flowers monoecious, male congested in disklike, short-pedunculate receptacles, in axillary fascicles, female solitary, fruit drupaceous, ovate, densely hairy.

Tongatapu: *Home.*

Also in Fiji.

137 Vava'u: *Crosby.*

Niuatoputapu: in yard in Hihifo, Dec. 6, 1951, *Hürlimann 372.*

Frequent throughout Tonga. Samoa to the New Hebrides.

Tongan name: *'ovava.*

[278] The leaves are used in preparing medicines.

[824] **Ficus prolixa** Forster f., Fl. Ins. Australia, Prodr., 77, 1786.

Medium to large, round-topped tree. Leaves alternate, elliptic-oblong or oblanceolate, acute at both ends, up to 15 cm. or more long and 6 cm. wide but mostly somewhat smaller, entire, glabrous, pinnately nerved, midrib prominent, lateral nerves slender, petioles up to 2 cm. long. Fruit globose, 5 mm. in diameter.

Tongatapu: *Forster.*

Vava'u: *Crosby.*

Possibly widespread in the Pacific but reported from Tonga only on the basis of the Forster and Crosby collections.

Ficus pumila Linnaeus, Sp. Pl., 1060, 1753.

Small, hairy, woody vine, adhering to walls and so forth, with rootlike tendrils. Leaves ovate-cordate, acute, scarcely 5 cm. long, reticulate-veiny, puberulent, sessile or subsessile. Flowers and fruit rare.

Tongatapu: covering walls of water tank near house in Nualei village, Mar. 9, 1953, *Yuncker 16255.*

Infrequent. An Indo-malayan plant widely distributed in warm countries as an ornamental vine.

Ficus scabra Forster f., Fl. Ins. Australia, Prodr., 76, 1786.

Rather small tree with puberulent twigs. Leaves alternate, ovate, acute, base rounded-cordate, oblique, up to 15 cm. or more long and 12 cm. wide, scabrous, pinnately nerved, nerves puberulent, petioles about 1 cm. long. Fruit globose, about 1 cm. in diameter, puberulent; peduncle short.

Tongatapu: *Home;* in forest near lagoon, near Vaini village, Feb. 26, 1953, *Yuncker 15049;* near Fangaveha, clinging to face of perpendicular seaside limestone cliff, some branches pendent, June 7, 1953, *Yuncker 16249.*

'Eua: in open forest above Fuai plantation near center of island, Mar. 20, 1953, *Yuncker 15387.*

Kao: in thin soil, in rocky alpine area near summit, alt. about 860 m., May 6, 1953, *Yuncker 15920.*

Niuatoputapu: on northwest slope of the mountain ridge above Hihifo, Dec. 5, 1951, *Hürlimann 338.*

Found throughout Tonga. Also in Samoa and perhaps elsewhere but frequently too widely interpreted.

This species resembles *F. storckii* closely; but according to E. J. H. Corner, who has studied the types, they differ in the fact that *F. storckii* has cystoliths on both sides of the lamina, whereas *F. scabra* has them on only the underside.

Tongan name: *masi'ata.*

137 **Tafahi**: beside road from township of Tafahi toward Faihavanui, in forest on steep volcanic slope, Dec. 18, 1951, *Hürlimann 614.*

Frequent on 'Eua, occasional elsewhere in Tonga. Also in Fiji and Niue. Tongan name: *salato.*

[68] [82] Contact with the leaves produces a very painful and persistent sting. I was told that whipping with the leaves was sometimes used in early times as a form of punishment.

Genus **Fleurya** Gaudichaud

Fleurya interrupta (Linnaeus) Gaudichaud, Voy. Freycinet, Bot., 497, 1826.

Herbaceous, scantily branched, nearly glabrous plant, up to 30 cm. or more tall. Leaves alternate, thin, ovate, acuminate, base rounded, truncate or subcordate, coarsely toothed, up to 6-8 cm. or more long and 5-6 cm. wide, petioles slender, up to 6-8 cm. or more long. Flowers small, greenish, in small clusters scattered along a slender, axillary peduncle.

Tongatapu: *Cook; Moseley.*

Vava'u: *Crosby.*

Tafahi: in plantation above road from township of Tafahi toward Faihavanui, Dec. 15, 1951, *Hürlimann 561.*

An occasional weed of plantations. From Africa to Australia and Polynesia.

Genus **Pilea** Lindley

Pilea microphylla (Linnaeus) Liebmann, Vidensk. Selsk. Skr. 5(2): 302, 1851.

Low, much-branched, glabrous, succulent, fernlike plant with tender stems. Leaves opposite, elliptic to spatulate or obovate, 3-4 mm. long. Flowers mostly monoecious, minute, greenish, clustered in leaf axils, stamens opening explosively.

Tongatapu: in moist soil under water tank in Nuku'alofa, Mar. 5, 1953, *Yuncker 15174.*

Occasional on moist soil, walls, rocks, and so forth, especially about villages. A tropical American species of wide distribution in warm countries. Often used as an ornamental pot plant.

Genus **Procris** Commerson

Procris pedunculata (J. R. and G. Forster) Weddell var. **ornata** A. C. Smith, Sargentia 1: 25, 1942.

Fleshy, somewhat decumbent, glabrous, terrestrial or epiphytic herb. Leaves alternate, up to about 15 cm. long, oblanceolate-oblong, acuminate, base oblique, petioles scarcely 1 cm. long. Flowers white, monoecious or dioecious, male flowers in branching, axillary clusters, female flowers crowded on a fleshy, headlike, axillary receptacle becoming red when mature.

'Eua: on moist forest floor along trail from central plain to summit of

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eastern ridge, Mar. 20, 1953, *Yuncker 15559;* on limestone cliff facing sea, near summit of eastern ridge, about middle of island, Apr. 8, 1953, *Yuncker 15687.*

Local in distribution in Tonga. Society Islands, Samoa, Niue, Melanesia and westward to Java or beyond.

Elatostemma sesquifolium Hassk. of Hemsley's list, based on a specimen collected on 'Eua by Lister, is presumably referable to this variety. Schröter (Fedde Repert. Sp. Nov. 45: 265, 1938) so cites a Lister collection from 'Eua.

Genus **Pipturus** Weddell

Identifications of *Pipturus* are by Carl Skottsberg.

Pipturus argenteus (Forster f.) **Weddell var. lanosus** Skottsberg, Acta Horti Gothob. 7: 62, 1932.

Small tree, up to 8 m. or more tall, young growth rather densely white-pubescent. Leaves alternate, oval-ovate, acuminate, base obtuse or abruptly acute, up to 15 cm. long and 8 cm wide, serrate, three-nerved from base, midrib branched upward, green above, white-woolly beneath, petiole slender, up to 8 cm. long. Flowers greenish white, in few-flowered, headlike clusters scattered along slender, axillary peduncles; fruit fleshy.

Tongatapu: *Forster;* in clearing along trail below Nualei, Mar. 9, 1953, *Yuncker 15225.*

'Eua: border of cliff on windswept limestone rocks near center of eastern ridge, Nov. 9, 1951, *Hürlimann 211;* in deep ravine short distance northeast of Ohonua village, Apr. 2, 1953, *Yuncker 15614;* on seaward face of limestone cliff on eastern ridge, Apr. 8, 1953, *Yuncker 15682.*

Kao: on rocky slope in open forest, May 6, 1953, *Yuncker 15879.*

Vava'u: *Lister;* near upper rim of limestone coastal cliff along northwestern side of island, May 25, 1953, *Yuncker 16162.*

Niuafo'ou: in crevice of 1946 lava flow along way to summit of main central crater, May 16, 1953, *Yuncker 15998.*

Tafahi: on rocky, volcanic soil, beside path from township of Tafahi to the Piu 'o Tafahi, Dec. 10, 1951, *Hürlimann 403;* on steep slope above northeast coast near northern end of island, Dec. 17, 1951, *Hürlimann 599;* on rocky volcanic soil, steep slope beneath township of Tafahi, Dec. 13, 1951, *Hürlimann 481.*

Niuatoputapu: bush forest on volcanic rock soil, on mountain range, eastward of Vaipoa, Dec. 5, 1951, *Hürlimann 364.*

Frequent on cliffs and rocky areas throughout Tonga. Also in Samoa and Rotuma.

Presumably, this is the *P. argenteus* Wedd. of Hemsley's and Burkill's lists.

Tongan names: *olonga, tou.*

A cordage fiber is obtained from the bark, and the bark and leaves are used in the preparation of medicines.

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824

137 **Pipturus argenteus** (Forster f.) Weddell var. ?

Small tree. Leaves elliptic-lanceolate, up to 10 cm. long and 4 cm. wide, green, rugose, slightly pubescent above, very densely white-lanate beneath. Flowers minute, short-pedicellate, in small paniculate, axillary clusters.

Kao: on rocky slope in clearing in forest, May 6, 1953, *Yuncker 15899.* Tongan name: *tou.*

FAMILY SANTALACEAE

Genus **Santalum** Linnaeus

Identifications of *Santalum* are by Carl Skottsberg.

Santalum yasi Seemann, Bonplandia 9: 258, 1861, *nomen;* Fl. Vit., 210, pl. 55, 1867.

Glabrous shrub or small tree, 4-5 m. or sometimes up to 7 m. tall, young branches slender and often somewhat pendulous. Leaves opposite, lanceolate, acute or acuminate, base acute, up to 8 or 9 cm. long and 2 cm. wide, pinnately nerved, petiole scarcely 1 cm. long, narrowly ridged by decurrent leaf blade. Flowers small, four-parted, at first greenish white, becoming dark red or purplish, short-pedicellate, in axillary, paniculate clusters up to 2 or 3 cm. long; fruit about 1 cm. in diameter and black when mature.

Tongatapu: toward coast near Fatai, Oct. 30, 1951, *Hürlimann 60;* on limestone terrace westward of Fu'amotu, Nov. 3, 1951, *Hürlimann 142;* in beach thicket, Sopu, Feb. 25, 1953, *Yuncker 15016;* in thicket near Niutoua village, Mar. 2, 1953, *Yuncker 15161.*

'Eua: in old clearing back of Pangai village along way to Fuai, Mar. 25, 1953, *Yuncker 15474.*

Nomuka: in thicket along road encircling island between sea and central lake, Apr. 30, 1953, *Yuncker 15853.*

Lifuka: near beach north of Pangai village, Apr. 24, 1953, *Yuncker 15702.*

Vava'u: along trail leading to summit of Talau, west of Neiafu, May 23, 1953, *Yuncker 16142.*

Niuatoputapu: on volcanic soil on mountain ridge above Vaipoa, Dec. 5, 1951, *Hürlimann 350.*

Frequent in thickets throughout Tonga. Also in Fiji.

Tongan name: *ahi.*

[303] The wood is fragrant and is used to perfume oil.

[824]

FAMILY OLACACEAE

Genus **Anacolosa** Blume

Anacolosa lutea Gillespie, B. P. Bishop Mus., Bull. 91: 5, fig. 3, 1932.

Small tree, up to 4 or 5 m. tall, branchlets slender. Leaves appearing two-ranked, oblong-elliptic or ovate, obtuse or acutish, base acute, up to 15 cm. long and 5 cm. wide, coriaceous, entire, pinnately nerved, petiole about 5 mm. long. Flowers six-parted, about

137 Occasional in forests throughout Tonga. Also in Fiji, Samoa, and Society Islands.

Tongan names: *kainikavea, topu'uno.*

[278] [824] The leaves[1] are used in medicines.

FAMILY ARISTOLOCHIACEAE

Genus **Aristolochia** Linnaeus

Aristolochia elegans Masters, Gard. Chron. 2: 301, 1885.

Slender, glabrous, high-climbing, twining vine. Leaves alternate, broadly triangular-reniform, obtuse, base broadly cordate, entire, petioles long and slender. Flowers solitary, axillary, on peduncles mostly 4-6 cm. long, tubular, tube curved with widely flaring limb up to 8 cm. wide, maroon with greenish-white markings. Fruit an oblong, angular, deeply grooved capsule, 4-6 cm. long, opening parachute-like when ripe.

'Eua: climbing in trees and shrubs in deep ravine near village of Ohonua, Apr. 2, 1953, *Yuncker 15616.*

Apparently of recent introduction in Tonga. A South American species widely grown as an ornamental.

Tongan name: *fue paipa holani.*

FAMILY POLYGONACEAE

Genus **Polygonum** Linnaeus

Polygonum glabrum Willdenow, Sp. Pl. 2: 447, 1799.

Glabrous herb up to 50 cm. or more tall. Leaves alternate, elliptic-lanceolate, acuminate, base cuneate, entire, up to 15 cm. or more long and 4 cm. wide, pinnately nerved, petiole about 2 cm. long, stipules forming a loose, brown, membranous sheath (ocrae) 1-2 cm. long. Flowers small, white, in compound spikelike clusters.

'Eua: *Lister.*

Nomuka: [collector?].

Vava'u: *Crosby;* along southern margin of Ngofe swamp on southwestern side of island, May 19, 1953, *Yuncker 16031.*

Infrequent in Tonga. A widespread tropical and subtropical species of both hemispheres.

Genus **Antigonon** Endlicher

Antigonon leptopus Hooker and Arnott, Bot. Beechey Voy., 308, 1841.

Attractive vine introduced and planted about dwellings, along walls, and so forth as an ornamental. Leaves alternate, wrinkled, cordate, entire, up to 10 cm. or more long, apiculate, petioles up to 2.5 cm. or more long. Flowers rose pink, in long, slender, loose racemes which end in branched tendrils.

Occasional in villages or along roadsides. A native of Mexico now cultivated in warm climates throughout the world.

[1] /Amylotheca insularum -- Analyst/

FAMILY CHENOPODIACEAE

The beet (*Beta vulgaris* Linnaeus), chard (*Beta vulgaris* var. *cicla* Linnaeus), and spinach (*Spinacia oleracea* Linnaeus) are occasionally cultivated in plantations as vegetable crops. 137 [244]

FAMILY AMARANTHACEAE

Genus **Amaranthus** Linnaeus

Amaranthus blitum Linnaeus, Sp. Pl., 990, 1753.

Low, spreading, nearly prostrate herb. Leaves small, alternate, obovate, obtuse, base acute, on slender petioles. Flowers very small, in few-flowered, axillary, subsessile clusters.

'Eua: weed beside trail near center of island, Apr. 5, 1953, *Yuncker 15643*. A depauperate specimen but seemingly this species.

Not common in Tonga.

Amaranthus paniculatus Linnaeus, Sp. Pl., ed. 2, 1406, 1763.

More or less pubescent herb. Leaves oblong-ovate to lanceolate. Flowers very small, in numerous, long, slender, ascending, dark red or yellowish spikes arranged in large, showy, paniculate clusters.

Vava'u: *Barclay*.

Widely cultivated as an ornamental. Occasional as a weed. [247]

Amaranthus viridis Linnaeus, Sp. Pl., ed. 2, 1405, 1763.

Coarse, glabrous, erect herb, up to about 1 m. tall. Leaves alternate, ovate to ovate-lanceolate, obtusish, base acute, long-petiolate. Flowers minute, greenish, sessile, in axillary clusters, in long, densely flowered, terminal and axillary spikes; fruit a membranous utricle.

Tongatapu: weed in banana plantation, Nualei, Nov. 1, 1951, *Hürlimann 100;* dooryard weed, Fu'amotu village, Mar. 4, 1953, *Yuncker 15164*.

'Eua: plantation weed on western side of island, Mar. 25, 1953, *Yuncker 15470*.

Tafahi: roadside weed between township of Tafahi and Faihavanui, Dec. 15, 1951, *Hürlimann 541*.

A weed of plantations and waste areas throughout Tonga. Widespread in warm climates.

Tongan names: *longolongo'uha, tupu'a*.

The young leaves are sometimes eaten as a vegetable.

Hemsley lists *Amaranthus caudatus* Linnaeus as collected by Cook on Tongatapu. This is an ornamental species, and there is some question as to whether it was in Tonga at the time of Cook's voyages. [262] [824]

Genus **Cyathula** Loureiro

137 **Cyathula prostrata** (Linnaeus) Blume, Bidjr. Fl. Java., 549, 1825.

Low, subprostrate, pubescent herb, the slender stems spreading and rooting at lower nodes. Leaves opposite, rhombic or ovate, acute at both ends, up to 5 cm. long and 2 cm. wide, petioles up to about 1 cm. long. Flowers very small, in loosely flowered clusters, in slender, elongated, terminal, spikelike racemes, reflexed in fruit, perianth segments becoming rigid, hooked awns.

'Eua: in forest clearing near summit of eastern ridge, Mar. 30, 1953, *Yuncker 15562.*

Vava'u: *Barclay; Crosby.*

Tafahi: along road, depression of former crater on summit of Piu 'o Tafahi, Dec. 11, 1951, *Hürlimann 451.*

Niuatoputapu: on hillside above Hihifo, Dec. 5, 1951, *Hürlimann 335.*

A plantation and waste area weed throughout the group. Pantropic.

Tongan name: *tolomo'unga.*

Genus **Achyranthes** Linnaeus

Achyranthes aspera Linnaeus, Sp. Pl., 204, 1753.

Coarse, erect or decumbent herb, up to 40 cm. or more tall, pubescent in younger parts. Leaves opposite, oval-obovate, acute, base wedge-shaped, entire, up to 12 cm. or more long, petiole 1-2 cm. long. Flowers small, greenish, sessile, in a long, slender, usually simple, terminal spike; fruit dry, about 5 mm. long, abruptly reflexed.

Tongatapu: *Moseley;* weed in waste area near sea below village of Niutoua, Mar. 2, 1953, *Yuncker 15137.*

'Eua: *Lister;* trailside weed on sea-facing terrace near Lokupa, Mar. 27, 1953, *Yuncker 15517.*

Lifuka: weed in plantation near sea above Pangai village, May 10, 1953, *Yuncker 15800.*

Vava'u: *Barclay.*

Tafahi: roadside weed, Dec. 15, 1951, *Hürlimann 540.*

A common plantation and waste area weed throughout the group. Pantropic.

Tongan name: *tamatama.*

[304] Used to tie up wound in circumcision.

[752]

[824]

Genus **Alternanthera** Forskål

Alternanthera sessilis (Linnaeus) R. Brown, ex Roemer and Schultes, Syst. 5: 554, 1819.

Spreading, subprostrate, branching herb, rooting at lower nodes, internodes with two pubescent lines. Leaves opposite, narrowly elliptic-obovate or oblanceolate, obtuse or acutish, base cuneate, entire, up to 5 or 6 cm. long, petiole up to about 1 cm long. Flowers small, scarious, sessile, white, in compact, axillary, headlike clusters.

Tongatapu: near shore, Nuku'alofa, Nov. 23, 1951, *Hürlimann 299.* 137

Vava'u: in wet boggy soil, margin of Ngofe swamp, May 19, 1953, *Yuncker 16043.*

Occasional as a waste area weed. Pantropic.

Tongan name: *fisi'i'ano.*

Genus **Gomphrena** Linnaeus

Gomphrena globosa Linnaeus, Sp. Pl., 224, 1753.

Low, branching, hairy herb. Leaves opposite, ovate to oblanceolate, cuspidate, entire, ciliate, up to 6 cm. or more long. Flowers small, in dense, chaffy-bracteate, pink, red or white, globose, cloverlike heads, on long, axillary and terminal peduncles and subtended by two ovate, involucre-like, leafy bracts.

Vava'u: *Barclay.*

Grown throughout Tonga as an ornamental, occasionally escaping. A tropical American species now widely distributed as an ornamental in warm and temperate climates. [247] [824]

FAMILY NYCTAGINACEAE

Genus **Boerhavia** Linnaeus

Boerhavia diffusa Linnaeus, Sp. Pl., 3, 1753.

Prostrate, glabrous or subglabrous herb, widely branching with reddish or green stems. Leaves scattered, somewhat fleshy, lanceolate to ovate, obtuse or acutish, base commonly obtuse, wavy-margined, lighter green or red beneath, up to 4 cm. long, petioles short. Flowers pinkish, small, tubular, on slender pedicels, in axillary and terminal, umbellate-paniculate clusters; fruit small, glandular, club-shaped, about 3 mm. long.

Lifuka: prostrate weed, in waste area between Pangai and southern end of island, Apr. 28, 1953, *Yuncker 15779.*

Vava'u: *Crosby.*

Tafahi: on volcanic rock, Dec. 15, 1951, *Hürlimann 516.*

Niuatoputapu: on mixed volcanic-calcareous soil, plantation near Matavai, Dec. 26, 1951, *Hürlimann 630.*

Occasional as a plantation and waste-area weed. Pantropic.

B. repens L. in Burkill's list.

Tongan name: *akataha kula.*

Genus **Pisonia** Plumier

Pisonia aculeata Linnaeus, Sp. Pl., 1026, 1753.

Dense, somewhat scrambling shrub, with stiff, axillary, recurved, sharp spines up to 1 cm. long. Leaves alternate, ovate-oblong or elliptic, obtuse or acutish, the base acute, up to 10 cm. long. Flowers yellowish-white, small, in terminal and axillary, pedunculate, cymose clusters; the fruit oblong or clavate, up to 15 cm. long, viscid-glandular.

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137 Tongatapu: on the shore eastward of Ma'ofanga, Oct. 29, 1951, *Hürlimann 20.*

Tafahi: near Fakafafa moe Tauloto, on sandy coral soil, Dec. 17, 1951. *Hürlimann 610.*

Occasional. Pantropic.

Tongan name: *vi taha.*

Pisonia grandis R. Brown, Prodr. Fl. Nov. Hollandiae 1: 422, 1810.

Medium to large, soft-wooded tree. Leaves opposite, rather thin, oval-ovate, obtuse to acutish, base acute, up to 20 cm. or more long and 10 cm. wide, petiole up to 5 cm. or more long. Flowers small, fragrant, in terminal, cymose clusters; fruit glandular.

Tongatapu: in forest between village of Niutoua and shore, Mar. 2, 1953, *Yuncker 15127.*

Nomuka: *fide* Burkill's list.

Lifuka: *Harvey.*

Vava'u: *Crosby.*

Occasional. From the Moluccas, Borneo, Australia, Marianas, the Philippines through Polynesia.

P. inermis Forst. in Hemsley's list.

Tongan name: *fotulona.*

[824] [417] The timber is used for fence posts and in general construction work.

Genus **Bougainvillea** Commerson

Bougainvillea spectabilis Willdenow, Sp. Pl. 2: 348, 1799.

Scrambling or climbing, armed, woody, vinelike shrub. Young growth finely pubescent. Leaves alternate, entire, elliptical, acute at both ends. Flowers nearly 2.5 cm. long, surrounded by three, large, purplish-red, ovate, veiny bracts.

This introduced ornamental is occasionally planted about dwellings. One or two specimens were noted along roadsides. It is a Brazilian species now pantropic in cultivation.

Tongan name: *felila.*

[247] [824] *Mirabilis jalapa* Linnaeus, the common garden four-o'clock, is cultivated as an ornamental garden plant.

FAMILY PHYTOLACCACEAE

Genus **Rivina** Linnaeus

Rivina humilis Linnaeus, Sp. Pl., 121, 1753.

Shrublike herb up to 1 m. tall. Leaves alternate, ovate-lanceolate, acute at both ends, 5-8 cm. long and 2-3 cm. wide, glabrous, bright green, pinnately nerved, petioles 2-3 cm. long. Flowers small, white, pale lavender or greenish, on slender pedicels 2-4 mm. long, in terminal and axillary, cylindrical racemes; fruit red, fleshy, one-seeded.

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Tongatapu: weed in waste area along road near Navutoka village, Feb. 27, 1953, *Yuncker 15093.*

'Eua: *Lister.*

Nomuka: in lakeside clearing along road encircling island between sea and central lake, Apr. 30, 1953, *Yuncker 15845.*

A weedy plant of waste areas, probably on all of the islands. An American species of pantropic distribution.

Tongan name: *polo*, presumably because of the superficial resemblance of the fruit to the fruit of species of *Solanum* which are also known as *polo*.

The red juice of the fruit is used as a dye.

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FAMILY AIZOACEAE

Genus Sesuvium Linnaeus

Sesuvium portulacastrum (Linnaeus) Linnaeus, Syst., ed. 10, 1058, 1759.

Succulent herb with prostrate, spreading stems up to 60 cm. or more long. Leaves narrowly spatulate, narrowed downward to short, clasping petiole. Flowers axillary, white to rose or pale lavender, solitary, on pedicels up to 1 cm. or more long; capsular fruit ovoid, seeds few, black.

Tongatapu: *Forster;* on tidal flat, Sopu, near Nuku'alofa, Feb. 25, 1953, *Yuncker 15041;* in limestone rock crevices near Blow Hole area, vicinity of Houma village, June 1, 1953, *Yuncker 16226;* on bare coral rocks on coastal terrace near Houma, Oct. 28, 1951, *Hürlimann 17.*

'Eua: *Lister;* on thin soil over coral rocks near shore, Lokupo, Mar. 27, 1953, *Yuncker 15518.*

Nomuka: on limestone rocks near sea, Apr. 30, 1953, *Yuncker 15854.*

Tafahi: near Hou, on lava rocks along shore, Dec. 17, 1951, *Hürlimann 592.*

A common strand plant throughout Tonga. Pantropic.

Tongan name: *kihikihimaka.*

Genus Tetragonia Linnaeus

Tetragonia expansa Murray, Comment. Soc. Reg. Sci. Gotting. Cl. Phys. 6: 13, 1783.

Somewhat succulent, assurgent herb with stems up to 1 m. or more long. Leaves alternate, smooth, ovate, acute, the base decurrent on the petiole, entire, up to 12 cm. long. Flowers small, yellow green, solitary, on short, axillary pedicels; fruit up to 1 cm. long, with four or five apical horns.

Tongatapu: July 19, 1926, *Setchell and Parks 15564.*

'Eua: *Lister.*

Infrequent. Australasia.

FAMILY PORTULACACEAE

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Genus **Portulaca** Linnaeus

Portulaca oleracea Linnaeus, Sp. Pl., 445, 1753.

Fleshy, glabrous, prostrate, spreading herb. Leaves obovate or oblong-cuneate, entire, fleshy, up to about 2.5 cm. long. Flowers four to six-parted, sessile, terminal, yellow, withering early; capsule membranous, dehiscent by a lid, the seeds numerous, small, black, slightly roughened.

Tongatapu: *U.S. Expl. Exped.;* weed in plantation near Nualei, Oct. 29, 1951, *Hürlimann 43;* on sand near lagoon, Hufangalupe, vicinity of Vaini village, Feb. 26, 1953, *Yuncker 15051.*

'Eua: in plantation between Pangai and Fuai, Mar. 25, 1953, *Yuncker 15465.*

Vava'u: *Crosby.*

Common throughout Tonga as a plantation and waste-area weed. A native of Europe now widely distributed as a weed.

Tongan name: *tamole.*

The plants are sometimes cooked and eaten as a vegetable.

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Portulaca quadrifida Linnaeus, Mantissa 1: 73, 1767.

Prostrate, fleshy, much-branched herb, stems slender, creeping and rooting at nodes, nodes pilose. Leaves opposite, elliptic-ovate or ovate, up to 6 mm. long and 3 mm. wide, acute or obtuse, acutish at base, petiole short. Flowers solitary, sessile, terminal, surrounded with long hairs and a four-parted involucre, corolla yellow; capsule circumscissile, the seeds gray.

Tongatapu: *U.S. Expl. Exped.*

Vava'u: *Barclay; Crosby.*

Occasional as a waste-area weed. A native of the Old World tropics now widespread as a weed.

Tongan name: *ngingie.*

Portulaca samoensis von Pollenitz, Repert. Sp. Nov. 33: 163, 1933.

Much-branched, prostrate, fleshy herb, stems slender with tufts of long white hairs at nodes. Leaves elliptic, obtuse or acutish, base acute or obtusish, 5-10 mm. long and 2 mm. wide, glabrous, petiole about 1 mm. long.

Tongatapu: on rocks near sea, near Ha'akame village, Mar. 12, 1953, *Yuncker 15282;* on thin soil on limestone rocks near the sea, Blow Hole area below Houma village, June 1, 1953, *Yuncker 16222.* Occasional on rocks near the shore.

Also in Samoa, Fiji, and Micronesia.

Tongan name: *kihikihi ngingie.*

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FAMILY MENISPERMACEAE

Genus **Stephania** Loureiro

Stephania forsteri (de Candolle) A. Gray, U.S. Expl. Exped., Bot. 1: 36, 1854.

Soft-wooded, twining, glabrous vine. Leaves alternate, round-ovate, bluntly pointed, the base rounded to retuse, peltate, up to 12 cm. or more long and 10 cm. wide, the petiole slender, nearly as long as the blade, attached 2-3 cm. from the margin of the blade. Flowers greenish, dioecious, in compound umbellate clusters; the fruit about 6 mm. in diameter, flattened and slightly laterally concave, red.

Tongatapu: *U.S. Expl. Exped.*

'Eua: in thicket near the center of the island, Mar. 28, 1953, *Yuncker 15544.*

Nomuka: in thicket along the road encircling the island between the sea and the central lake, Apr. 30, 1953, *Yuncker 15823.*

Vava'u: *Harvey; Crosby;* in thicket along the road near Houma village, May 22, 1953, *Yuncker 16115.*

Frequent in thickets throughout Tonga. Malaya to Polynesia.

S. hernandiaefolia Walp. in Hemsley's and Burkill's lists.

FAMILY ANNONACEAE

Genus **Cananga** Hooker f. and Thomson

Cananga odorata (Lamarck) Hooker f. and Thomson, Fl. India 1: 130, 1855.

Tree, up to 15 m. or more tall. Leaves alternate, elliptic-oblong, acute, base rounded, obtuse, entire, up to 20 cm. or more long and 7 cm. wide, pubescent, pinnately nerved, petiole mostly less than 2 cm. long. Flowers greenish yellow, drooping, pubescent, very fragrant, the petals linear-lanceolate, up to 8 cm. or more long, on long, puberulent pedicels, in axillary, pedunculate, umbellate clusters; fruit oblong, fleshy, black, seeds numerous.

Tongatapu: *Graeffe; Moseley;* in Navutoka village, Feb. 27, 1953, *Yuncker 15086;* in Ma'ofanga village, Nov. 23, 1951, *Hürlimann 312.*

'Eua: in Pangai village, Apr. 7, 1953, *Yuncker 15658.*

Vava'u: *Crosby.*

Introduced and cultivated in villages throughout Tonga. A southern Asiatic plant now widely cultivated in tropical countries.

Tongan name: *mohokoi.*

The wood is used for canoe outriggers; the leaves and bark in medicines; and the flowers for ornaments, in leis, and for scenting oil.

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Genus **Polyalthia** Blume

Polyalthia amicorum A. C. Smith, sp. nov. (fig. 9).

Arbor ad 5 m. alta trunco circiter 45 cm. diametro partibus novellis pilis fuscis 0.1-0.3 mm. longis exceptis glabra; ramulis gracilibus apices versus haud 1 mm. diametro teretibus

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copiosissime lenticellatis, hornotinis nigro-purpurascentibus vel brunneis flexuosis demum cineris; petiolis gracilibus canaliculatis 1.5-3 mm. longis; foliorum laminis in sicco papyraceis fusco-viridibus anguste oblong-ellipticis (5-) 7-11.5 cm. longis, 2-3.7 cm. latis, basi inaequilateraliter rotundatis vel subcordatis et in petiolum subito decurrentibus, apice obtusis vel rotundato-cuspidatis, margine integris et paullo incrassatis, obscure pellucido-punctatis, costa utrinque striato-rugulosa supra plana subtus prominente, nervis secundariis utrinsecus 7-9 arcuato-adscenditibus anastomosantibus et rete venularum copioso urtinque manifeste prominulis; inflorescentiis infructescentiisque desideratis. 137

Tongatapu: tree about 5 m. tall, stem about 45 cm. in diameter, near Pikula, June 1, 1953, *Yuncker 16228* (type in U.S. Nat. Herb., nos. 2128585 and 2157731).

Tongan name: *motelolo.*

In spite of the absence of flowers and fruits, the cited specimen can confidently be referred to *Polyalthia,* representing the first Tongan record and an extension of the genus eastward from Fiji. Its closest relative seems to be the Fijian *P. amygdalina* (A. Gray) Gillespie, to which it is strikingly similar in indument of young parts and in leaf shape and leaf texture. However, the new species differs from *P. amygdalina* in the crowded lenticels of its branchlets, in its smaller leaf-blades (those of the Fijian species attaining a size of about 15 × 5 cm.), and in having its leaf-apices obtuse or rounded-cuspidate rather than acute. Another Fijian species suggesting *P. amicorum* in vegetative characters is the Lauan *P. laddiana* A. C. Smith, but that has more sparsely lenticillate branchlets and broader, ovate-elliptic leaf-blades which are acute to acuminate at apex.

Genus **Artabotrys** R. Brown

Artabotrys uncinatus (Lamarck) Merrill, Philippine Jour. Sci. **7C**: 234, 1912.

Climbing shrub with spreading, somewhat zigzag branches. Leaves elliptic- or oblong-lanceolate, acuminate, the base acute, somewhat glossy, entire, up to 15 cm. or more long and 4 or 5 cm. wide, the petiole scarcely 1 cm. long. Flowers greenish yellow, fragrant, 2.5 cm. or more long, on stout, hooked, axillary peduncles; the fruit of several, clustered, yellowish, fleshy carpels about 2 cm. long.

Tongatapu: in thicket between Ha'akame village and sea, Mar. 12, 1953, *Yuncker 15283;* in village of Nukunuku, Nov. 18, 1951, *Hürlimann 284.*

Lifuka: in Pangai village, climbing over trellis, Apr. 25, 1953, *Yuncker 15701.*

Vava'u: climbing in thicket near Houma village, May 22, 1953, *Yuncker 16117.*

Rather frequent as a cultivated ornamental, occasionally as an escape. A native of southern China, now widely cultivated in tropical countries. [247] [824]

Tongan name: *mohokoi honolulu.*

The flowers are used to scent oil. [303] [824]

Genus **Annona** Linnaeus

137 **Annona muricata** Linnaeus, Sp. Pl., 536, 1753.

Small tree. Leaves alternate, oblong or oblong-elliptic, acute or acuminate, glabrous, somewhat glossy above, up to about 14 cm. long and 4 cm. wide, petioles short. Flowers 2-3 cm. or more long, yellowish green, solitary or in pairs; the fruit fleshy, heart-shaped, up to 15 cm. or more long, covered with short, fleshy spines, seeds numerous, embedded in the white, juicy, somewhat acid, edible pulp.

Tongatapu: in a garden in Nuku'alofa, Mar. 8, 1953, *Yuncker 15219.*

[245 824] Occasional in villages as an introduced fruit tree. From tropical America. Now widely cultivated in tropical countries.

Tongan name: *'apele 'initia.*

Annona reticulata Linnaeus, Sp. Pl., 537, 1753.

Small to medium-sized tree. Leaves alternate, elliptic- or oblong-lanceolate, acute, up to 17 cm. long and 5 cm. wide, pinnately nerved, the petioles about 12 mm. long. Flowers about 2.5 cm. long, axillary; the fruit about 10 cm. thick, smooth, divided into hexagonal areas, edible.

[245 824] Occasional in villages. From tropical America. Now widely cultivated in tropical countries for its fruit.

Annona squamosa Linnaeus, Sp. Pl., 537, 1753.

Small tree. Leaves two-ranked, oblong or elliptic-lanceolate, acute, up to 12 cm. or more long and 4-5 cm. wide, the petioles about 1 cm. long. Flowers solitary, greenish yellow, about 2.5 cm. long, petals narrowly lanceolate, obtusish, concave at base; fruit about 8 cm. thick, somewhat heart-shaped, tuberculate, sweet, edible.

Tongatapu: *U.S. Expl. Exped.*

Vava'u: *Crosby.*

[245 824] Occasional in villages. From tropical America. Now widely grown in tropical countries for its fruit.

Tongan name: *'apele papalangi.*

FAMILY MYRISTICACEAE

Genus **Myristica** Linnaeus

Myristica hypargyraea A. Gray, U.S. Expl. Exped., Bot. 1: 33, 1854.

Medium-sized tree, up to 10 m. or more tall, the twigs minutely puberulent glabrescent. Leaves oblong-elliptic, acute, base obtuse or acute, up to 35 cm. or more long and 12 cm. wide, pinnately nerved, midrib prominent, lateral nerves slender, green above, whitish beneath, petiole stout, up to 2 cm. long. Flowers small, axillary, brown-pubescent; fruit rounded-ovoid, densely brown-pubescent, up to 4 or 5 cm. long, with deeply lacinated aril.

Tongatapu: *U.S. Expl. Exped.:* near lagoon at Fatai, Oct. 30, 1951, *Hürlimann 56;* in open woods near Vaini village, Feb. 26, 1953, *Yuncker 15064.*

'Eua: *Lister;* in open forest along trail to summit of eastern ridge, Mar.

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20, 1953, *Yuncker 15385;* on terrace south of Vaingana River, Nov. 13, 1951, *Hürlimann 279.*

Kao: in open forest on rocky slope, May 6, 1953, *Yuncker 15968.*

Rather frequent in forested areas. Also in Samoa.

Tongan name: *kotone.*

The wood is used for banana shooks and general building purposes; the flowers and fruits, for leis; and the aril, for ornament.

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Myristica inutilis Rich, ex A. Gray, U.S. Expl. Exped., Bot. 1; 34; 1854.

Small tree with slender branchlets. Leaves lanceolate, oblong- or obovate-elliptic, acuminate, base obtuse or acutish, thin, up to 25 cm. long and 7 cm. wide, pinnately nerved, brown-pubescent beneath, petioles up to 2.5 cm. long. Flowers small, in axillary clusters; fruit oblong, brown-pubescent when young, up to 3 cm. long, short apiculate, aril lacinated.

Tongatapu: *U.S. Expl. Exped.*

In Samoa, Solomon Islands, and the New Hebrides, but there is some question as to the occurrence of this species in Tonga. It was included by Hemsley in his list but later collectors have apparently not found it. It was cited by Gray from Tutuila and Savaii as abundant and from Tongatapu.

FAMILY MONIMIACEAE

Genus Hedycarya Forster

Hedycarya alternifolia Hemsley, Linn. Soc. Bot., Jour. 30: 215, 1894.

Glabrous tree. Leaves alternate, round-ovate or broadly elliptical, obtuse, remotely and obscurely denticulate, up to 10 cm. or more long and 8 cm. wide. Flowers very small, on a depressed hypanthium, in axillary racemose clusters.

'Eua: *Lister.* Endemic.

Perkins [in Pflanzenr. 49 (IV. 101. Nachtr.): 7, 1911] excludes this species from the genus and, further, expresses doubt that it belongs in the Monimiaceae.

Hedycarya denticulata (A. Gray) Perkins and Gilg, Pflanzenr. 4 (IV. 101): 19, 1901.

Tree up to 10 m. or more tall. Leaves opposite, elliptic-ovate, acute at both ends, distantly and minutely denticulate, up to 10 cm. or more long and 6 cm. wide, petiole 2 cm. or more long. Flowers very small, borne on a convex hypanthium, in terminal branching clusters; fruit ovoid, pointed, up to 1 cm. long.

'Eua: in forested area near center of island, Mar. 18, 1953, *Yuncker 15333.* Infrequent. Also in Samoa.

Hedycarya dorstenioides A. Gray, Jour. Bot. 4: 83, 1866.

Small to medium-sized, glabrous tree. Leaves opposite, elliptic, acute at both ends, entire, up to 12 cm. or more long and 7 cm. wide, pinnately nerved, petioles 1 to 2 cm. long. Flowers minute, in a convex hypanthium up to about 1 cm. wide, in branching racemose or paniculate clusters; fruit ovoid, acute, about 1 cm. long, black.

137 'Eua: *Lister;* margin of forest at summit of eastern ridge, Mar. 30, 1953. *Yuncker 15561;* near base of eastern ridge below Fuai, Nov. 8, 1951. *Hürlimann 158, 162.*

Abundant in Fiji.

FAMILY LAURACEAE

Genus **Persea** Gaertner

Persea americana (Linnaeus) Miller, Gard. Dict., ed. 8, no. 2, 1768.

Medium to large tree. Leaves alternate, entire, mostly 10 cm. or more long, elliptic, oval, or sometimes obovate, pubescent beneath, somewhat coriaceous, acute, nerves prominent, petioles up to 5 cm. long. Flowers small, greenish, short-pedicellate, in terminal, paniculate clusters; drupe fleshy, 5 cm. or usually more long, subglobose to pear-shaped, seed single, large, round.

Introduced and occasional in villages. A tropical American species now pantropic in distribution.

Tongan name: *'avoka.*

[262] [824] The fruit is used as food.

Genus **Litsea** Lamarck

Litsea mellifera A. C. Smith, Jour. Arnold Arboretum **32**: 54, 1951.

Tree, up to 35 m. tall. Leaves alternate, broadly elliptical or elliptic-ovate, obtusely pointed, base abruptly acute, 10-18 cm. long and 6-14 cm. wide, light green above, whitened beneath, pinnately nerved, nerves prominent, tomentulose beneath, petioles up to 4 cm. long. Flowers small, unisexual, in umbellate-racemose, axillary clusters; fruit ellipsoidal, up to 3 cm. long, in persistent cupulate calyx.

'Eua: in margin of forest near Reichelmann's Fuai plantation near center of island, alt. about 240 m., Mar. 22, 1953, *Yuncker 15431.*

Tongan name: *mamea.*

This interesting collection, with young staminate inflorescences, is very similar to the Fijian material of *L. mellifera;* no basis for even infraspecific separation can be found from the specimens at hand. Apparently this is the first record of *Litsea* in Tonga, a very satisfying discovery since the genus occurs in Fiji (see A. C. Smith, op. cit., pp. 45-57) and Samoa. *L. mellifera* is known from several of the Fijian islands and occurs there with considerable frequency at altitudes from sea level to about 850 m.; it is less common, however, than *L. pickeringii* (Seemann) Drake, a species more to be expected in Tonga because it occurs on the islands of Lau (A. C. Smith).

Genus **Cryptocarya** R. Brown

Cryptocarya glaucescens R. Brown var. **pacifica** Burkill, Linn. Soc. Bot., Jour. **35**: 52, 1901.

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Small tree. Leaves alternate, elliptic, or elliptic-subobovate, obtuse or subacute, base acute, 6-7 cm. or more long and 3-4 cm. wide, pinnately nerved, finely venulose. Fruit globose, about 1 cm. in diameter, with slightly raised longitudinal ribs, bluntly pointed at apex, base abruptly narrowed to pedicel.

Vava'u: *Crosby 241;* mountain trail near Neiafu, Aug. 1926, *Setchell and Parks 15653.*

Perhaps endemic; the Horne Fijian specimens cited by Burkill represent *C. turbinata* Gillespie, a Fijian endemic, and the New Caledonian record mentioned by Burkill needs further consideration.

Tongan name: *motou.*

Cryptocarya hornei Gillespie, B. P. Bishop Mus., Bull. 83: 6, fig. 4, 1931.

Small tree, up to 6 or 8 m. tall, with slender branches. Leaves alternate, somewhat coriaceous, glossy, lanceolate to ovate, acuminate, base acute, three-nerved from near base, entire, petioles scarcely 1 cm. long. Flowers small, in terminal and axillary, paniculate, finely yellow-hairy clusters; fruit globose, with extended apex, glossy, up to 1 cm. in diameter.

'Eua: in open forest near center of island, Mar. 19, 1953, *Yuncker 15357;* margin of forest above Fuai plantation, near center of island, Apr. 5, 1953, *Yuncker 15641.*

This is the first report of this species for Tonga, where it is infrequent; the type is from Fiji.

Tongan name: *motou.*

The bark is used to scent oil.

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[824]

Genus Endiandra R. Brown

Endiandra elaeocarpa Gillespie, B. P. Bishop Mus., Bull. 83: 7, fig. 6, 1931.

Tree, up to 25 m. tall. Leaves opposite or alternate, ovate to obovate, apex rounded or bluntly acuminate, base acute, coriaceous, pinnately nerved, entire, petiole up to 1.5 cm. long. Flowers small, in paniculate clusters up to 5 cm. long; fruit green to black, cylindrical, up to 6 cm. long and 2 cm. thick, often curved.

Vava'u: along road above Ha'alaufuli on way to coastal cliff on northeastern side of island, May 21, 1953, *Yuncker 16112.*

This specimen is sterile, but it agrees well with this species in its vegetative characters. If it is correctly identified, this is apparently a new record for it in Tonga. Also found in Fiji and Samoa.

Tongan name: *motou.*

Genus Cassytha Linnaeus

Cassytha filiformis Linnaeus, Sp. Pl., 35, 1753.

Slender, filiform, branching, glabrous, yellow or yellowish green, twining, parasitic plant, attached to host by means of suckerlike haustoria. Leaves reduced to minute scales. Flowers small, greenish white, sessile, in pedunculate, spikelike clusters; fruit fleshy, subglobose, about 5 mm. thick.

137 Tongatapu: along road about 2 km. west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15008.*

'Eua: *Lister;* on herbs and shrubs along strand, Lokupo, Mar. 27, 1953, *Yuncker 15523.*

Lifuka: in thicket near sea north of Pangai village, Apr. 25, 1953, *Yuncker 15733.*

Vava'u: *Crosby.*

Niuatoputapu: toward seacoast south of Falehau, Dec. 7, 1951, *Hürlimann 390.*

Frequent throughout Tonga. Pantropic.

Tongan name: *fatai.*

FAMILY HERNANDIACEAE

Genus **Gyrocarpus** Jacquin

Gyrocarpus americanus Jacquin, Stirp. Am., 282, pl. 178, 1763.

Medium to large tree, up to 12 m. or more tall, branches rather thick. Leaves alternate, ovate, acuminate, base rounded, abruptly acute at long petiole, up to 20 cm. or more wide, entire or occasionally lobed, palmately three-nerved. Flowers small, green, unisexual, in rather broad, terminal, cymose clusters; fruit nutlike.

Tongatapu: margin of cemetery, Nuku'alofa, *Setchell and Parks 15294.*

'Eua: in village of Ohonua, Apr. 2, 1953, *Yuncker 15633;* near dwelling in Pangai village, Apr. 28, 1953, *Yuncker 15793.*

Occasional. A species of pantropic distribution.

Tongan name: *pukovili.*

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The leaves and bark are used in preparing medicines.

Genus **Hernandia** Plumier

Hernandia moerenhoutiana Guillemin, Sci. Nat. Bot., Ann. II, 7: 187, 1837.

Large tree, up to 10 or 12 m. tall. Leaves alternate, oval-oblong or somewhat obovate, obtuse or somewhat pointed, base acute, entire, up to 10 cm. or more long and 8 cm. wide, palmately three-nerved, midrib strongly branched upward, petiole up to 6 cm. or more long. Flowers cream-colored, in loose, many-flowered, long-stalked, axillary clusters near ends of branches; fruit enclosed in a white or reddish, fleshy, balloonlike vesicle.

Tongatapu: *Moseley;* edge of Niutoua village, Mar. 2, 1953, *Yuncker 15109.*

'Eua: *Lister;* in Ohonua village, Apr. 2, 1953, *Yuncker 15630.*

Nomuka: on knoll near beach short distance above village, Apr. 30, 1953, *Yuncker 15812.*

Vava'u: *Crosby;* in clearing on slope leading to lagoon at Vaihoi, May 26, 1953, *Yuncker 16198.*

Occurs throughout Tonga. Society Islands to Fiji.

Tongan name: *pipitui.*

The flowers and the fruit are used for leis and ornamentation, and the wood for general construction purposes.[1]

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Hernandia ovigera Linnaeus, in Stickman, Herb. Amb., 14, 1754.

Medium to large tree, up to 20 m. or more tall. Leaves alternate, ovate, acute, peltate near base, entire, up to 20 cm. long and nearly as wide, five- to nine-nerved from petiole, petiole up to about as long as blade. Flowers monoecious, white, numerous in long-stalked, axillary and terminal, cymose clusters; fruit dry, somewhat ribbed, enclosed in an enlarged, fleshy, white or reddish, balloonlike vesicle with circumscissile opening.

Tongatapu: *Home.*

'Eua: in forest on seaward terrace near Lokupo, Mar. 27, 1953. *Yuncker 15533.*

Lifuka: in seaside thicket north of Pangai village, Apr. 24, 1953. *Yuncker 15711.*

Vava'u: *Crosby.*

Niuatoputapu: between Hihifo and Vaipoa, Dec. 7, 1951. *Hürlimann 373.*

Grows throughout Tonga, usually near the sea. From Indo-Malaysia to Polynesia.

H. peltata Meisn. in Hemsley's and Burkill's lists.

Tongan names: *fotulona, puko.*

The trunks are used for dugout canoes and the timber for banana shooks and general building purposes.

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FAMILY CAPPARIDACEAE

Genus **Crataeva** Linnaeus

Crataeva religiosa Forster f., Pl. Esculent., 45, 1786.

Small tree. Leaves alternate, three-foliate, leaflets elliptic or elliptic-obovate, sharply acuminate, base wedge-shaped, entire, up to 15 cm. or more long and 7 cm. wide, thin, petiolules less than 1 cm. long, petiole up to 12 cm. or more long. Flowers four-parted, clustered toward ends of branches on slender pedicels up to 4 cm. long, petals spatulate, creamy white, spreading to about 5 cm. in width, gynophore slender, up to 4 or 5 cm. long.

Tongatapu: in clay soil in thicket near Bay of Mu'a by Pelehake, Aug. 10, 1953, *W. T. Ha'angana* [*Yuncker 16282*]. This is the only specimen known in Tonga, and presumably was introduced.

From India to the Philippines and into Polynesia.

Genus **Capparis** Linnaeus

Capparis sandwichiana de Candolle, in DC. Prodr. 1: 245, 1824.

More or less prostrate, straggling or trailing shrub. Leaves alternate, oval or rounded, obtuse, base cordulate, entire, up to 4 cm. or more long, pinnately nerved, petiole slender, up to 4 cm. or more long. Flowers irregular, about 5 cm. wide, at first white, turning pink as they age, solitary, axillary, stamens numerous, ovary exserted on a long gynophore; fruit green, berrylike, ellipsoidal, about 5 cm. long, ridged, many-seeded, peduncle curved.

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[1] /Hernandia moerenhoutiana --Analyst/

137 Tongatapu: in crevices on perpendicular face of seaside cliff at Fangavelia, June 7, 1953, *Yuncker 16250*. Believed to be a new record for Tonga, where it is rare.

Known also from Hawaii, Niue, Pitcairn Island, Cook Islands, Tuamotus; rare in Fiji and Samoa.

247 764 824 *Cleome spinosa* L. is occasionally cultivated as an ornamental in villages and cemeteries.

FAMILY CRUCIFERAE

Genus **Lepidium** Linnaeus

Lepidium virginicum Linnaeus, Sp. Pl., 645, 1753.

Erect, much-branched, glabrous or somewhat puberulent herb. Basal leaves up to 12 cm. long, dissected, terminal lobe large, obovate, lateral lobes small, stem leaves alternate, about 2.5 cm. long, oblanceolate, serrate, subsessile, acute. Flowers very small, white, in terminal and axillary, racemose clusters; fruit 3 mm. or less wide, flat, nearly round, notched at apex.

Tongatapu: weed in plantation, Nualei, Oct. 27, 1951, *Hürlimann 5*; roadside east of Nuku'alofa, Mar. 7, 1953, *Yuncker 15206*.

'Eua: weed at Fuai plantation, Mar. 22, 1953, *Yuncker 15418*.

Niuatoputapu: near shore in Hihifo, Dec. 29, 1951, *Hürlimann 645*.

A common dooryard and waste area weed throughout Tonga. An American species now of wide distribution in warm climates.

Genus **Coronopus** Gaertner

Coronopus didymus (Linnaeus) J. E. Smith, Fl. Brit. 2: 691, 1800.

Low, spreading, pubescent, fetid weed. Leaves one- to two-pinnately dissected, the divisions narrowly linear, entire or toothed. Flowers very small, white, in small, axillary, racemose clusters; fruit flattened, deeply notched at apex, wrinkled.

Tongatapu: weed in plantation, Nualei, Nov. 1, 1951, *Hürlimann 102*; weed on sand in cemetery near Haveluliku village, June 3, 1953, *Yuncker 16233*.

'Eua: weed in old coconut plantation near Ha'aluma, Apr. 1, 1953, *Yuncker 15586*.

A plantation and waste-area weed throughout Tonga. This European weed is now of wide distribution in tropical and temperate regions.

Senebiera didyma Pers. in Hemsley's list.

Tongan name: *lesivao*.

Genus **Nasturtium** R. Brown

Nasturtium sarmentosum (Solander) O. E. Schulz, Bot. Jahrb. 32: 595, 1902.

Low, short-stemmed, glabrous herb with creeping, flagelliform branches. Leaves mostly radical, deeply pinnately lobed and divided, terminal leaflet rounded and somewhat larger than lateral ones. Flowers small, white, in long, racemose clusters on mostly leafless peduncles up to 10 cm. or more long; the pods subterete, divergent, about 2.5 cm. long.

Tongatapu: in crevices on seaside limestone cliff at Fangaveha, June 7, 1953, *Yuncker 16251.*

'Eua: weed near plantation house, Mar. 22, 1953, *Yuncker 15422.*

Kao: on thin soil near summit, alt. about 990 m., May 6, 1953, *Yuncker 15909,* a form [?] with small, scarcely divided, dentate leaves.

Vava'u: *Barclay.*

A roadside and waste-area weed throughout Tonga. Widespread in the Pacific area.

Cardamine sarmentosa Forst. in Hemsley's list.

Tongan name: *'atono.*

The cauliflower (*Brassica oleracea* Linnaeus var. *botrytis* Linnaeus), cabbage (*B. oleracea* var. *capitata* Linnaeus), kohlrabi (*B. caulorapa* Pasquale), radish (*Raphanus sativus* Linnaeus), and turnip (*Brassica rapa* Linnaeus) are cultivated to some extent as garden vegetables. [244] [824]

FAMILY CRASSULACEAE

Genus Bryophyllum Salisbury

Bryophyllum pinnatum (Lamarck) Kurz, Asiatic Soc. Bengal, Jour. 40(2): 52, 1871.

Fleshy, glabrous plant, somewhat woody at the base, the flowering stems up to about 1 m. tall. Leaves very fleshy, opposite, simple or pinnately compound, with three or five oval-oblong, crenately toothed, obtuse leaflets which readily develop young plants from notches when in contact with soil, petioles up to 5 cm. or more long. Flowers about 3-4 cm. long, four-lobed, calyx greenish, thin, inflated, corolla reddish, tubular, in large terminal panicles.

Tongatapu: in sandy waste area near sea east of Nuku'alofa, Feb. 27, 1953, *Yuncker 15173.*

Occasional in sandy or rocky areas near the sea throughout Tonga. A tropical Asian species now of pantropic distribution.

Tongan name: *pipi vao.*

FAMILY PITTOSPORACEAE

Genus Pittosporum Banks

Pittosporum arborescens Rich, ex A. Gray, U.S. Expl. Exped., Bot. 1:223, 1854.

Tree, up to 9 or 10 m. or more tall. Leaves alternate, crowded toward ends of branches, obovate-oblong, oblong, or elliptic, obtuse or subacute, base acute to cuneate, up to 12-14 cm.

137 long and 5 cm. wide, subcoriaceous, glabrous, somewhat glossy above, paler beneath, pinnately nerved, strongly areolate-venulose by transmitted light, petiole 1-2 cm. long, ridged by decurrent blade margins. Flowers in terminal and axillary cymose clusters; fruit globular-ovoid, about 1.5-2.5 cm. long, surface rough, dark, splitting longitudinally when ripe, halves recurving, yellow orange within.

Tongatapu: *U.S. Expl. Exped.; Graeffe;* near Vaini village, Feb. 26, 1953, *Yuncker 15039.*

'Eua: *Lister;* in thin forest above Fuai plantation, near center of island, Mar. 19, 1953, *Yuncker 15361.*

Nomuka: in thicket along road encircling island, Apr. 30, 1953, *Yuncker 15824.*

Lifuka: near center of island along trail between Pangai village and eastern coast, Apr. 27, 1953, *Yuncker 15769.*

Vava'u: *Crosby;* along upper rim of limestone coastal cliff on northwestern shore of island, May 25, 1953, *Yuncker 16167.*

Frequent in forested areas throughout Tonga. Also in Fiji.

Tongan name: *masikona.*

The fruit is used to poison fish.

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Pittosporum brackenridgei A. Gray, U.S. Expl. Exped., Bot. 1: 225, 1854.

Small, glabrous tree, up to 5 or 6 m. tall. Leaves alternate, somewhat coriaceous, crowded toward ends of branches, oval-oblong or elliptical, obtuse or subacute, base acute, pinnately nerved, up to 12-14 cm. long and 5 cm. wide, petiole 1-2 cm. long. Fruit subglobular, many-seeded.

Tongatapu: *Cartwright.*

'Eua: *Lister.*

Infrequent. Also in Fiji and Niue.

Pittosporum rhytidocarpum A. Gray, U. S. Expl. Exped., Bot. 1: 228, pl. 18, 1854.

Shrub or small tree up to 5 or 6 m. tall, glabrous except for pubescent inflorescence. Leaves alternate, somewhat crowded toward ends of branches, oblanceolate to obovate-oblong, acute to short-acuminate, narrowing to base, pinnately nerved, margins entire or slightly undulate, up to 12-17 cm. long and 5 cm. wide. Flowers in terminal or axillary clusters, short-pedicellate, corolla tubular, about 1 cm. long, lobes spreading; fruit oblong, about 3 cm. long, thick and woody, two-edged, warty.

'Eua: *Lister.*

Infrequent. Also in New Hebrides and Fiji where it is very common.

Pittosporum spathaceum Burkill, Hook. Icones Pl. 26: pl. 2561, 1898.

Small tree, with slender branches. Leaves alternate, clustered near ends of branches, elliptic-obovate, glabrous, apex rounded, obtuse, base acute, 6-8 cm. long and 2.5-3 cm. wide. Flowers in few-flowered panicles about half as long as leaves, calyx spathaceous, short appendiculate, petals linear, longitudinally striate, ovary bicarpellate.

Vava'u: *Crosby 200.* Apparently known only from the type.

'Eua: border of eastern ridge in central part of island, Nov. 9, 1951, 137 *Hürlimann 206;* in dry, open, grazing area on western slope of eastern ridge, Apr. 6, 1953, *Yuncker 15652;* on sea-facing limestone cliff near summit of eastern ridge, Apr. 8, 1953, *Yuncker 15679.*

In Tonga, apparently limited to the eastern ridge on the island of 'Eua. Also known in the Ryukyu and Bonin Islands, the Hawaiian Islands, Pitcairn, and other islands of Polynesia.

Genus **Eriobotrya** Lindley

Eriobotrya japonica (Thunberg) Lindley, Linn. Soc., Trans. 13: 102, 1821.

Low, evergreen tree, up to about 6 m. tall. Leaves clustered toward ends of stout, pubescent stems, alternate, elliptic, or oval-oblanceolate, sharply acuminate, base cuneate, up to 20 cm. or more long, sharply toothed, glossy above, rusty-woolly beneath, pinnately nerved, petiole short, winged. Flowers white, fragrant, 1-2 cm. wide, in terminal, branching, densely woolly clusters; fruit yellow, globose, downy, edible.

Tongatapu: side of trail near Nualei village, Mar. 9, 1953, *Yuncker 15223.*

Cultivated for its fruit and occasionally as an escape. A native of China now widely cultivated. [245/824]

Tongan name: *loketi.*

Genus **Parinarium** Aublet

Parinarium glaberrimum Hasskarl, Tijdschr. Nat. Ges. 10: 147, 1843 [*nomen nudum*]; Flora 27: 583, 1844.

Small to rather large tree, up to 10 m. or more tall. Leaves alternate, elliptic-oblong or ovate-lanceolate, acute, base rounded, obtuse, up to 20 cm. or more long and 8 cm. wide, entire, somewhat coriaceous, pinnately nerved, midrib with two glands near base. Flowers crowded, in branching, pubescent, axillary, racemose clusters, corolla whitish, anthers yellow, on bluish filaments; fruit large, brown, rough.

Tongatapu: in Nukunuku village, Jan. 11, 1952, *Hürlimann 679;* below Fatai village, Mar. 10, 1953, *Yuncker 15261.*

Vava'u: *Crosby;* along road west of Houma village, May 22, 1953, *Yuncker 16119.*

Tafahi: in grassy area, Tafahi township, Dec. 15, 1951, *Hürlimann 568.*

In villages and occasionally in forested areas. From Java and Borneo eastward to Polynesia.

P. laurinum A. Gray in Burkill's list.

Tongan names: *pipi, pipi failolo.*

The seeds are used to scent oil.

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Parinarium insularum A. Gray, U. S. Expl. Exped., Bot. 1: 488, pl. 54, 1854.

Somewhat twiggy tree up to 12 m. or more tall. Leaves alternate, ovate or lance-ovate, acute to acuminate, the base rounded, obtuse or cordulate, 7-8 cm. long and 3-4 cm. wide, 137 glossy above, pinnately nerved, areolate-nervulose, nervules prominent beneath, petiole about 5 mm. long, stout. Fruit ellipsoidal, brown-scurfy, 4-5 cm. long.

Vava'u: *Crosby;* near Mataika village, May 27, 1953, *Yuncker 16205.* Infrequent.

Also in Fiji and Samoa.

Tongan name: ***hea.***

247 245 824 The garden rose (*Rosa* spp.) is planted as a common ornamental about dwellings. One depauperate peach tree (*Prunus persica* Siebold and Zuccarini) was seen in Nuku'alofa.

FAMILY CONNARACEAE

Genus **Santaloides** [Linnaeus] O. Kuntze

Santaloides samoense (Lauterbach) Schellenberg, in Engler Bot. Jahrb. **58**: 180, 1923; Pflanzenr. **103** [IV. 127]: 122, 1938.

Woody vine, glabrous throughout. Leaves alternate, odd-pinnate, leaflets ovate or round-ovate, acuminate, base rounded, obtuse, blade margin sometimes subpeltately continuous over petiolule, up to 6 cm. or more long and 4 cm. wide, pinnately nerved, areolate venulose, somewhat chartaceous, petiolules about 5 mm. long. Flowers 4-5 mm. wide, white, on slender pedicels about as long as flowers in paniculate clusters.

'Eua: climbing in forest on western slope near summit of central part of eastern ridge, Mar. 24, 1953, *Yuncker 15442.*

Kao: climbing in trees, on rocky forested slope, May 6, 1953, *Yuncker 15890.*

Tongan names: ***kavahaha, tuamea.***

The cited specimens agree very well with an isotype of the species, *Vaupel 491* (US), thus providing what appears to be a new generic record for Tonga (A. C. Smith).

FAMILY LEGUMINOSAE

Genus **Serianthes** Bentham

Serianthes myriadenia Planchon, ex Bentham, Hook. London Jour. Bot. **5**: 108, 1846.

Broad-topped tree, up to 8 or 10 m. tall, branchlets, leaves, and so forth brown-pubescent. Leaves bipinnate, alternate, pinnae several, up to 10 cm. or more long, leaflets numerous, oblong, obtuse, base cordulate, asymmetrical, about 12 mm. long and 5 mm. wide, sessile. Flowers several, in branching, axillary clusters, calyx about 1 cm. long, dentate, densely pubescent, corolla greenish yellow, up to 2 cm. long, lobed to about middle, pubescent, stamens numerous, exserted, deep red; pod oblong, somewhat compressed.

Vava'u: *Crosby;* at summit of Talau, west of Neiafu, May 23, 1953, *Yuncker 16141.*

Infrequent. Fiji.

Tongan name: ***mohemohe.***

Genus **Albizzia** Durazzini

Albizzia lebbeck (Linnaeus) Bentham, Hook. London Jour. Bot. 3: 87, 1844. 137

Tree, up to 8 or 12 m. tall. Leaves alternate, bipinnate, pinnae about six, up to 15 cm. long, leaflets six to eight, oblong, obtuse, base obtuse, asymmetrical, variable in size, up to 3-5 cm. long, subsessile, glabrous. Flowers yellowish, in headlike clusters up to 4 cm. in diameter; pods oblong, up to 20 cm. long and 3 cm. wide, flat, reticulate, impressed opposite seeds.

Tongatapu: in yard, Ma'ofanga, Nov. 23, 1951, *Hürlimann 321.*

Infrequent as a cultivated tree. A native of tropical Asia and Africa, now widely cultivated and naturalized.

Tongan name: *kasia.*

The timber is used for a variety of purposes.

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Genus **Acacia** Willdenow

Acacia simplicifolia (Linnaeus f.) Druce, Bot. Exch. Cl. Brit. Isles, Rept. 4: 602, 1917.

Tree, up to 6-8 m. tall, glabrous. Leaves alternate, broadly elliptical or subovate, obtuse, base cuneate-decurrent, parallel-nerved, up to 10-12 cm. long and 8 cm. wide, petiole less than 1 cm. long, winged by decurrent blade margins. Flowers small, yellow, in axillary, headlike clusters 1 cm. or less in diameter: pods up to 12 cm. or more long, somewhat constricted between seeds.

Tongatapu: *Cook; Home;* in strand thicket along road to east of Nuku-'alofa, Feb. 27, 1953, *Yuncker 15100.*

'Eua: *Lister;* seaward margin of strand thicket, Ha'aluma, Apr. 1, 1953, *Yuncker 15590.*

Nomuka: in strand thicket above village, Apr. 30, 1953, *Yuncker 15866.*

Lifuka: along beach toward northern end of island, Apr. 25, 1953, *Yuncker 15745.*

Vava'u: *Crosby.*

Niuatoputapu: near shore at Hihifo, Dec. 6, 1951, *Hürlimann 370.*

A frequent strand species throughout Tonga. Samoa, Fiji, New Hebrides, and New Caledonia.

A. laurifolia Willd. in Hemsley's and Burkill's lists.

Tongan name: *tatangia.*

The wood is used in handicraft work.

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Genus **Leucaena** Bentham

Leucaena glauca (Linnaeus) Bentham, Jour. Bot. Hook. 4: 416, 1842.

Shrub or small tree, up to 5 or 6 m. tall, young growth puberulent. Leaves alternate, bipinnate, with five or six pairs of pinnae, leaflets numerous, oblong, acute, asymmetrical, sessile, 6-12 mm. long and about 2 mm. wide. Flowers small, white, in globose, headlike, axillary clusters, about 2.5 cm. in diameter, peduncle up to 4 or 5 cm. long; pods thin, flat, up to 15 cm. long and 1.5 cm. wide, seeds small, brown.

137 Tongatapu: in thicket near sea, Sopu, Feb. 25, 1953, *Yuncker 15013.*

'Eua: in thicket northeast of Ohonua village, Apr. 2, 1953, *Yuncker 15625.*

Nomuka: in thicket on seaward side of road encircling island, Apr. 30, 1953, *Yuncker 15851.*

Vava'u: forming a large colony on seaside cliff along trail to Talau, west of Neiafu, May 23, 1953, *Yuncker 16145.*

Frequent throughout Tonga. A tropical American plant now of pantropic distribution.

Tongan name: *siale mohemohe.*

The timber is used for posts and in house construction.[1]

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Leucaena insularum (Guillemin) Daniker, Nat. Ges. Zürich, Vierteljahrschr. 77: Beibl. 19, 176, 1932.

Small tree, up to 5 m. or more tall, the young growth puberulent. Leaves alternate, bipinnate with eight or more pairs of pinnae, leaflets oblong, 45 or more on each pinna, acutish, obliquely inequilateral, up to about 7 mm. long, sessile. Flowers very small, pale pink, in globose, headlike, axillary, pedunculate clusters, peduncles up to 2 cm. or more long; pods slightly curved, up to 10 cm. or more long and 2 cm. wide.

Tongatapu: *Cook;* at shore north of Hofoa, Oct. 30, 1951, *Hürlimann 92;* near beach below Niutoua village, Mar. 2, 1953, *Yuncker 15108.*

'Eua: forming dense thicket along strand short distance above high-tide limit, Lokupo, Mar. 27, 1953, *Yuncker 15532.*

Lifuka: in thicket near beach at southern end of island, Apr. 28, 1953, *Yuncker 15791.*

Rather frequent throughout Tonga. Fiji, Niue, and New Caledonia.

L. forsteri Benth. in Hemsley's list.

Tongan names: *feifai, mohemohe.*

The timber is used in handicraft work.

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Genus **Mimosa** Linnaeus

Mimosa pudica Linnaeus, Sp. Pl., 518, 1753.

Low, decumbent, subwoody, loosely branching, prickly plant. Leaves bipinnate, pinnae usually in one or two pairs, each with 15 or more pairs of linear-oblong leaflets up to 8 mm. or more long, acute, asymmetrical, sessile, sensitive. Flowers small, in globose, rose-pink, headlike, pedunculate, axillary clusters; the pod flat, thin, 1-2 cm. long, bristly.

Tongatapu: in waste area near Nualei, Oct. 29, 1951, *Hürlimann 45;* in grassy area near Niutoua village, Mar. 2, 1953, *Yuncker 15158.*

'Eua: *Lister.*

Vava'u: *Harvey, Crosby.*

A common weed in plantations, grazing areas and waste areas throughout Tonga. An American species now pantropic in distribution.

Tongan name: *mateloi.*

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[1] /Leucaena glauca -- Analyst/

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Genus **Adenanthera** Linnaeus

Adenanthera pavonina Linnaeus, Sp. Pl., 384, 1753.

Medium to large tree. Leaves bipinnate with about 6 or 8 pinnae, each usually with 9-11 or more leaflets, the leaflets oval or oval-oblong, obtuse at both ends or the base subacute, up to 4.5 cm. long and 3 cm. wide, glabrous, the petiolules about 2 mm. long. Flowers small, greenish-white, short-pedicellate, in slender, spikelike, pedunculate, racemose clusters up to 15 cm. or more long, fragrant; pods up to 25 cm. or more long and 2 cm. wide, falcately curved, becoming spirally twisted upon opening, the seeds lens-shaped, bright red, shining, very uniform in size, ornamental.

Tongatapu: near village of Niutoua, Mar. 2, 1953, *Yuncker 15113.*

'Eua: along roadside near Houma village, Mar. 26, 1953, *Yuncker 15510.*

Niuafo'ou: behind Futu, Jan. 7, 1952, *Hürlimann 655.*

Occasional in or near villages throughout Tonga. An Indian species now pantropic in cultivation.

Tongan name: *lopa.*

The wood is durable and used in handicraft work; the seeds, as beads for ornamentation.

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Genus **Entada** Adanson

Entada phaseoloides (Linnaeus) Merrill. Philippine Jour. Sci. 9C: 86, 1914.

Stout, glabrous, woody vine, climbing high in forest trees. Leaves alternate, evenpinnate, leaflets glossy, commonly four, asymmetrically oval-ovate, blunt or acute, obtuse or cordulate at base, up to 10 cm. long and 5 cm. wide but mostly smaller, venulose, petiolules up to 5 mm. long. Flowers very small, greenish, in long, axillary, short-pedunculate spikes up to 30 cm. long: pod very large, woody, up to 1 m. long and 10 cm. wide, seeds lens-shaped, brown, 3 cm. or more in diameter.

Tongatapu: near coast north of Fatai, Oct. 30, 1951, *Hürlimann 61;* climbing high in tree, along road between Lavengatonga village and sea, Mar. 7, 1953, *Yuncker 15188.*

'Eua: *Lister;* central valley between Pangai and Fuai, Nov. 10, 1951, *Hürlimann 230;* margin of forest near center of island, Mar. 18, 1953, *Yuncker 15324.*

Vava'u: *Crosby;* summit of Talau, west of Neiafu, May 24, 1953, *Yuncker 16156.*

Niuafo'ou: in thicket in interlava "island" on way to upper rim of main crater, May 16, 1953, *Yuncker 16006.*

Frequent in forested areas throughout Tonga. From Africa to southeastern Asia and Polynesia.

E. scandens Benth. in Hemsley's and Burkill's lists. See Johnson (Sargentia 8: 136-137, 1949) for an interesting discussion of this species.

Tongan names: *valai, pa'anga, lau pa'anga.*

Genus **Maniltoa** Scheffer

137 **Maniltoa amicorum** A. C. Smith, sp. nov. (fig. 11).

Arbor ad 18 m. alta, trunco ad 75 cm. diametro, partibus inflorescentiae exceptis ubique glabra, ramulis gracilibus teretibus lenticellatis; foliis plerumque 9-12 (interdum 7-20) cm. longis 3-jugis vel apicem ramulorum versus 2-jugis raro 1-jugis, petiolis teretibus rugulosis 6-15 mm. longis, rhachi gracili, petiolulis ut petiolis rugulosis ad 4 mm. longis vel subnullis; laminis foliolorum subcoriaceis in sicco viridi-olivaceis inaequilateraliter ellipticis, (4-) 5-9 cm. longis, (2-) 3-5 cm. latis, basi obtusis, apice obtusis vel obtuse cuspidatis et leviter emarginatis, margine integris paullo recurvatis, costa supra leviter elevata subtus prominente, nervis secundariis principalibus utrinsecus 7-9 cum aliis interspersis marginem versus anastomosantibus et rete venularum conspicuo supra paullo subtus manifeste prominulis; inflorescentia apicem ramulorum versus axillari breviter racemosa circiter 15-flora juventute bracteis numerosis involucrata, bracteis papyraceis, maximis suborbiculari-obovatis ad 20×15 mm. apice rotundatis dorso copiose sericeo-puberulis (pilis pallidis 0.1-0.2 mm. longis) margine crispato-ciliolatis mox caducis, bracteis exterioribus minoribus glabrescentibus; rhachi sub anthesi 12-16 mm. longa basibus florum incrassata, bracteis floriferis medianis anguste obovatis 18-25 mm. longis 3-5 mm. latis apice rotundatis dorso ut bracteis majoribus pilosis, bracteolis lateralibus lineari-lanceolatis 5-6 mm. longis 0.5-1 mm. latis dorso in lineam medianam hispidulis mox caducis; pedicellis teretibus sub anthesi 10-13 mm. longis in receptaculum ad 3 mm. diametro incrassatis; sepalis 4 sub anthesi reflexis submembranaceis oblongis, 11-12 mm. longis, 3-6 mm. latis, apice obtusis; petalis 5 raro 6 membranaceis obovato-lanceolatis, sub anthesi 12.5-13.5 mm. longis 2-2.5 mm. latis, basi angustatis, apice subacutis; staminibus 35-40 plerumque 2-seriatis, filamentis teretibus 10-15 mm. longis, antheris oblongo-ellipsoideis 1.8-2 mm. longis apice obscure apiculatis; ovario stipitato sub anthese circiter 5×2.5 mm., ovulis 1 vel 2, stylo tereti 6-7 mm. longo inferne pilis castaneis paucis ad 1 mm. longis dorso crispato-piloso; legumine juvenili falcato-ellipsoideo ad 4×2.5 cm., utroque obtuso, pericarpio ruguloso.

'Eua: stately tree about 18 m. tall, trunk about 75 cm. in diameter, straight and free of branches below, with tender pink new growth appearing here and there from large buds, on side of ravine short distance northeast from village of Ohonua on western side of islands, Apr. 2, 1953, *Yuncker 15635.*

Vava'u: tree about 12 m. tall, trunk about 45 cm. in diameter, in open forest along upper rim of coastal limestone cliff on northwestern side of island. May 25, 1953, *Yuncker 16168* (type, in U.S. Nat. Herb., *nos. 2128567 and 2157730*); tree about 15 m. tall, trunk about 45 cm. in diameter, on forested slope above Lake Anovai, on southwestern side of island, May 19, 1953, *Yuncker 16040.*

"Vava'u and Lifuka": Aug.-Oct. 1855, *W. H. Harvey* (Gray Herb.).

Tongan names: *tamanu, pekepeka.*

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An excellent timber tree.

This is doubtless the plant listed as *Cynometra grandiflora* A. Gray by Hemsley (Linn. Soc. Bot., Jour. 30: 176, 1894) and Burkill (op. cit. 35: 35. 1901). It is closely related to two of the Fijian species of *Maniltoa* reviewed by me in 1950 (Jour. Arnold Arboretum 31: 166-171), *M. grandiflora* (A. Gray) Scheffer and *M. brevipes* A. C. Smith. Differences among these three species are mainly matters of degree, but it seems that the sum of their minor characters indicates the desirability of keeping them apart. From *M. grandi-*

[TEXT CONTINUED ON PAGE 134]

137 *flora*, the new species differs in the somewhat more prominent venation of its leaflets and in its more compact inflorescences, with the rachis and pedicels at anthesis being only about half as long (these parts in Gray's species being about 3 cm. and 2-2.5 cm. long respectively). The sepals of our species are slightly the shorter, as are the petals, filaments, and style (in *M. grandiflora* the petals are 12-19 × 3-4 mm., the filaments are 15-25 mm. long, and the style is 9-10 mm. long). Although in foliage, *M. amicorum* is essentially similar to *M. brevipes*, the venation of the leaflets is finer and more obviously prominulous beneath. The new species is further distinguished by having its bud-enclosing bracts sericeous-puberulent rather than glabrous dorsally, in the longer rachis of its inflorescence (about 1 cm. long in *M. brevipes*), in its shorter style, and in the larger bracts, both median and lateral, subtending the flowers.

Genus **Tamarindus** Linnaeus

Tamarindus indica Linnaeus, Sp. Pl., 34, 1753.

Medium to large, thickly branched, round-topped tree. Leaves alternate, even-pinnate, leaflets up to 36 or more on each pinna, opposite, oblong, obtuse or slightly emarginate, base obliquely inequilateral, about 2 cm. long and 5 mm. wide, sessile. Flowers yellow, striped with red, in axillary or terminal, racemose clusters; pods up to 12 cm. or more long, curved, seeds several, embedded in pulpy tissue.

Tongatapu: margin of coconut plantation below Nualei village, Mar. 9, 1953, *Yuncker 15237*.

Lifuka: northern margin of Pangai village, May 11, 1953, *Yuncker 15987*.

Vava'u: *Crosby*.

Occasional in villages. An African species now of wide distribution in tropical countries.

Tongan name: *tamaline*.

262 824 The pulpy part of the pod is edible.

Genus **Intsia** Thouars

Intsia bijuga (Colebrooke) O. Kuntze, Rev. Gen. Pl. 1: 192, 1891.

Rather large tree. Leaves alternate, even-pinnate, leaflets four, oval-ovate, obtuse or emarginate, base oblique, up to 8 or 10 cm. long and 5-7 cm. wide, glabrous, finely pinnately nerved, petiolules about 5 mm. long. Flowers about 1 cm. long, calyx puberulent, only one petal developing, petal pinkish, rounded; pod up to 20 cm. long and 6 cm. wide, coriaceous, seeds orbicular.

Kao: margin of forest near abandoned plantation, alt. about 30 m., May 6, 1953, *Yuncker 15957*.

Rare in Tonga. From Madagascar through Malaya and from the Philippines and the Caroline Islands eastward to Fiji and Samoa.

Tongan name: *fehi*.

313 824 322 The wood is very hard and is used in handicraft work.

Genus **Bauhinia** Linnaeus

Bauhinia monandra Kurz, Asiatic Soc. Bengal, Jour. 42(2):73, 1874. 137

Shrub or small tree with brown-hairy young growth. Leaves alternate, rounded-ovate in outline, up to 10 cm. or more wide, deeply cleft a third or more of its length into two winglike lobes, otherwise entire, palmately nerved. Flowers white, pink and yellow variegated, in terminal or axillary racemes, with solitary stamen; pod elongated, up to 15 cm. or more long.

An introduced ornamental, rather frequent in villages and occasionally an [245]
escape. A tropical American species now widely cultivated. [824]

Genus **Cassia** Linnaeus

Cassia javanica Linnaeus, Sp. Pl., 379, 1753.

Rather small tree. Leaves alternate, pinnate, up to about 30 cm. long, leaflets oval, obtuse, up to 5 cm. long. Flowers pink and white, in large racemose clusters; pod cylindrical, up to 30 cm. or more long.

An introduced ornamental, this Malayan species is now widely cultivated. [245]
A few specimens of what was taken to be this species were noted in villages. It [824]
is probable that *C. fistula* Linnaeus also is present, though it was not noted.
Cassia alata Linnaeus is frequent in dooryards. [351]

Cassia leschenaultiana de Candolle, Soc. Phys. Hist. Nat. Genève, Mém. 2: 132, 1824.

Pubescent, subshrubby herb, up to 80 cm. or more tall. Leaves pinnate, alternate, up to about 7 cm. long, leaflets linear-oblong, apex rounded, mucronate, base obliquely inequilateral, up to 30-40 on each leaf, 1-2 cm. long and 3 mm. wide, essentially sessile. Flowers yellow, 1-1.5 cm. wide, several, in axillary fascicles; pods up to 5 cm. long and 4 mm. wide, very thin, linear, slightly falcate.

Vava'u: roadside between Mataika and Feletoa villages, May 19, 1953, *Yuncker 16023.*

Infrequent. A pantropic weed, possibly of Asiatic origin.

Tongan name: *mateloi vava'u.*

Cassia occidentalis Linnaeus, Sp. Pl., 377, 1753.

Glabrous, erect, branching herb, up to 1 m. or more tall, slightly woody at base. Leaves alternate, even-pinnate, leaflets mostly 10 or 12, elliptic- or ovate-lanceolate, acuminate, base inequilaterally rounded, up to 7 cm. or more long and 2-3 cm. wide, petiolules 1-2 mm. long, petiole with a conspicuous gland near base. Flowers yellow, about 2.5 cm. wide, in few-flowered, axillary, racemose clusters; pods flat, glabrous, falcate, up to 12 cm. or more long.

'Eua: *Lister.*

Lifuka: in thicket near beach north of Pangai village, Apr. 24, 1953, *Yuncker 15708.*

Occasional. A tropical American species now pantropic in distribution.

Tongan name: *pi.*

137 **Cassia sophera** Linnaeus, Sp. Pl., 379, 1753.

Subshrubby herb, up to 1 m. or more tall, young parts somewhat pubescent. Leaves alternate, even-pinnate, leaflets about 14, lanceolate or lance-ovate, acuminate, base somewhat obliquely acute, 3-4 cm. long and 1-1.5 cm. wide, petiolules about 1 mm. long. Flowers yellow, about 2 cm. wide, several, in axillary, pedunculate, racemose clusters.

Tongatapu: *Forster; Home.*

'Eua: in waste area near Ohonua village, Apr. 2, 1953, *Yuncker 15620.*

Tafahi: on stone wall in Tafahi township, Dec. 15, 1951, *Hürlimann 576.*

Occasional as a plantation and waste-area weed. Pantropic.

Tongan name: *matui.*

Cassia toro Linnaeus, Sp. Pl., 376, 1753.

Erect, slightly woody plant, up to about 1 m. tall. Leaves alternate, pinnate, leaflets commonly six, oval-obovate, obtuse, base obliquely obtuse, finely pubescent, petiolules 1-2 mm. long. Flowers yellow, about 1-2 cm. wide, in axillary pairs on short peduncles; pods slender, up to 15 cm. long and 3 mm. thick.

Tongatapu: roadside near air field of Fu'amotu, Nov. 3, 1951, *Hürlimann 144;* in clearing near Navutoka village, Feb. 27, 1953, *Yuncker 15078.*

Vava'u: roadside above Ta'anea village, May 21, 1953, *Yuncker 16085.*

An occasional waste-area weed. A tropical American species now widespread in warm countries.

Tongan names: *te'ekosi, pini papalangi.*

Genus **Delonix** Rafinesque

Delonix regia (Bojer) Rafinesque, Fl. Tellur. 2: 92, 1836.

Rapidly growing, medium-sized, round-topped, spreading tree with smooth, light-colored bark. Leaves alternate, up to 60 cm. long, bipinnate, leaflets very numerous, oblong, obtusish, base oblique, subsessile. Flowers bright red, 8 cm. or more wide, petals clawed, upper petal with whitish or yellowish streaks; pods flat, pendent, up to 30 cm. or more long and 3 to 5 cm. wide.

Niuatoputapu: ornamental tree in Falehau village, Dec. 7, 1951, *Hürlimann 379.*

245 Occasional in villages as an ornamental. An African species now widely cultivated in warm countries.

824 Tongan name: *'ohai.*

Genus **Caesalpinia** Linnaeus

Caesalpinia crista Linnaeus, Sp. Pl., 380, 1753.

Scandent or scrambling shrub with long branches and leaves armed with sharp, recurved spines or prickles, young parts brown-pubescent. Leaves large, bipinnate, leaflets oblong to ovate, acuminate, mucronate, base rounded, obtuse, up to 8 cm. long and 4 cm.

wide but mostly somewhat smaller, petiolules 2-3 mm. long. Flowers in supra-axillary, racemose clusters, calyx greenish brown, corolla yellow; pod nearly lenticular, prickly, about 5 cm. long, seeds smooth, glossy, nearly round, very hard. 137

Tongatapu: in seaside forest below village of Lavengatonga, Mar. 6, 1953, *Yuncker 15195.*

Nomuka: sprawling over shrubs in thicket along shore above village, Apr. 30, 1953. *Yuncker 15868.*

Vava'u: *Crosby.*

Niuatoputapu: in forest on edge of mountain range above Vaipoa, Dec. 5, 1951, *Hürlimann 351.*

Occasional throughout Tonga. Widespread in warm countries.

C. bonducella Flem. in Hemsley's list. For discussions relative to the complicated nomenclature of this species, see Urban (Symb. Ant. 2: 269, 1900) and Merrill (Philippine Jour. Sci. **5C**: 53, 1910).

Tongan name: *talatala'amoa.*

The slender, prickly stems are used to make snares with which to capture fruit bats. [224] [824]

Caesalpinia pulcherrima (Linnaeus) Swartz, Observ. Bot., 166, 1791.

Glabrous shrub or small tree, up to 2 m. or more tall, branches usually armed with short, stiff, scattered prickles. Leaves alternate, bipinnate, leaflets oblong, obtuse or shallowly emarginate, base obliquely inequilateral, up to 2.5 cm. long, light green. Flowers red or orange, about 2.5 cm. wide, on long pedicels in large, terminal racemes, stamens long-exserted; pods oblong, flat, up to 10 cm. long.

'Eua: *Lister.*

Occasional as an ornamental. Widely cultivated in warm countries. [245] [824]

Genus Sophora Linnaeus

Sophora tomentosa Linnaeus, Sp. Pl., 373, 1753.

Shrub, up to about 4 m. tall, densely gray-pubescent. Leaves alternate, odd-pinnate, leaflets up to about 21, obovate or suborbicular, apex rounded, obtuse, base obtuse or slightly acute, up to 5 cm. or more long and 3.5 cm. wide, petiolules about 3 mm. long. Flowers yellow, about 2 cm. long, on pedicels about 5 mm. long, in terminal racemes up to 15 cm. or more long; pods up to 15 cm. long, strongly constricted between seeds.

Tongatapu: *U.S. Expl. Exped.; Graeffe;* small island in lagoon northeast of Fatai, Oct. 30, 1953, *Hürlimann 80;* outer margin of seaside thicket, Sopu, west of Nuku'alofa, May 30, 1953, *Yuncker 15297.*

'Eua: seaward margin of strand thicket, Ha'aluma, Apr. 1, 1953, *Yuncker 15588.*

Nomuka: in thicket near sea a short distance above village, Apr. 30, 1953, *Yuncker 15865.*

Frequent in strand thickets throughout Tonga. Pantropic.

Tongan names: *lata, fetu'a tahi.*

A common clearing and waste-area weed throughout Tonga. Pantropic. *I. anil* L. in Hemsley's and Burkill's lists.

Tongan name: *'akauveli.*

Indigofera tinctoria Linnaeus, Sp. Pl., 751, 1753.

Erect, slightly pubescent, suffrutescent plant, up to 2 m. tall. Leaves pinnate, leaflets opposite, nine to 13, up to 2.5 cm. long, obovate-oblong. Flowers reddish, in rather lax, sessile, axillary racemes; pods straight or nearly so, spreading to reflexed, up to 3 cm. long.

'Eua: *Lister.*

Infrequent. A tropical American species now of widespread distribution in warm countries.

Genus **Tephrosia** Persoon

Tephrosia purpurea (Linnaeus) Persoon, Syn. Pl. 2: 329, 1807.

Silky-pubescent, much-branched, somewhat shrubby plant, with ascending stems up to 50 cm. or more tall. Leaves alternate, odd-pinnate, leaflets oblong-subspatulate, emarginate, base acute, up to 2.5 cm. long and 1 cm. wide, petiolules about 1 mm. long. Flowers small, commonly white, short-pedicellate, in terminal or leaf-opposed, racemose clusters; pods about 4 cm. long, straight, halves twisted when open.

Tongatapu: *Forster.*

Nomuka: in clearing along road encircling island between sea and central lake, Apr. 30, 1953, *Yuncker 15809.*

Kao: in clearing on lower slope, May 6, 1953, *Yuncker 15869.*

Vava'u: *Crosby;* near upper rim of steep seaside cliff above Leimatua, May 20, 1953, *Yuncker 16065.*

Niuatoputapu: near edge of mountain ridge above Hihifo, Dec. 5, 1951, *Hürlimann 344.*

A common weed in waste areas throughout Tonga. Southern Asia, Malaya, and Australia to Polynesia.

Tongan names: *kavahuhu, kavahuhu 'uta, kavahuhu tahi, kavahuhu veli.* An extract of the root is used to poison fish.

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Genus **Sesbania** Scopoli

Sesbania grandiflora (Linnaeus) Persoon, Syn. Pl. 2: 316, 1807.

Tree, up to 12 m. tall. Leaves alternate, even-pinnate, long and narrow, leaflets of 20-40 pairs, oblong, obtuse, mucronate, up to 3.5 cm. long. Flowers few, up to 9 cm. long, white, in few-flowered, axillary racemes; pods linear, pendulous, somewhat curved, 20-60 cm. long and 7-8 cm. wide.

Vava'u: *Crosby.*

Infrequent. From India through Malaya, Australia, and the Philippines to Polynesia. Widely planted.

about 7 mm. long, short-pedicellate, in few-flowered, short, axillary, racemose clusters; pods 2 cm. or more long, thin, red brown. 137

Tongatapu: edge of mangrove swamp, Nuku'alofa, *Setchell and Parks 15326.*

Nomuka: in thicket along road encircling island, Apr. 30, 1953, *Yuncker 15839.*

Vava'u: *Crosby.*

Occasional in strand thickets. India, southern China, New Guinea, Australia, Mariana and Caroline Islands, Philippines, Fiji, and other islands.

Probably the *D. monosperma* Dalz. of Burkill's list.

Tongan name: *moho.*

The seeds, which are said to be poisonous, are used as beads. [301] [824] [278]

Genus **Derris** Loureiro

Derris trifoliata Loureiro, Fl. Cochinchinensis, 433, 1790.

Glabrous, scandent shrub, with rather large, scattered lenticels, climbing to 5 m. or more high. Leaves alternate, odd-pinnate, leaflets three to seven, elliptic or oblong-subovate, acuminate, base obtuse, variable in size, up to 10 cm. or more long and 4 cm. wide, somewhat glossy, petiolules 5-8 mm. long. Flowers white to rose, up to 1 cm. long on short, slender pedicels in axillary, racemose, or paniculate clusters; pods one- to two-seeded, conspicuously veiny, subrhomboid to broadly oblong, up to 5 cm. long and 3 cm. wide.

Tongatapu: *U.S. Expl. Exped.;* toward beach near Fatai, Oct. 30, 1951, *Hürlimann 51;* in thicket near the beach, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15015.*

Vava'u: *Crosby.*

Occasional near the beach. Tropical Africa, Asia, Malaya, Australia, and Polynesia.

D. uliginosa Benth. in Hemsley's and Burkill's lists.

Tongan name: *kavahaha.*

The stem fibers are strong and are used for cordage. An extract of the roots is used as fish poison. [283] [226] [824]

Genus **Inocarpus** Forster

Inocarpus edulis J. R. and G. Forster, Char. Gen. Pl., 66, 1776.

Rather large tree, up to 12 m. or more tall. Leaves alternate, oblong to elliptic-lanceolate, entire, obtuse or bluntly pointed, base cordate, coriaceous, pinnately nerved, strongly venulose, coriaceous, up to 30 cm. or more long and 10 cm. wide, petioles stout, scarcely 1 cm. long. Flowers yellowish white, 1 cm. or more long, sessile, in spicate, pubescent clusters; fruit fleshy, rounded, 6 cm. or more long, edible.

Tongatapu: *Graeffe; Moseley;* in plantation near Nualei, Nov. 1, 1951, *Hürlimann 118;* in forested area near Lavengatonga village, Mar. 6, 1953, *Yuncker 15180.*

137 'Eua: *Lister;* in open woods along trail between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15484.*

Nomuka: along road encircling island, Apr. 30, 1953, *Yuncker 15830.*

Lifuka: side of road north of Pangai village, Apr. 25, 1953, *Yuncker 15740.*

Vava'u: *Crosby;* in clearing near coastal cliff along eastern side of island, below Houma village, May 22, 1953, *Yuncker 16128.*

Tafahi: beside road between township of Tafahi and landing place Faihavanui, Dec. 15, 1951, *Hürlimann 566.*

Niuatoputapu: on main mountain ridge above Vaipoa, to the east, Dec. 5, 1951, *Hürlimann 357;* plain southeast of Falehau, Dec. 7, 1951, *Hürlimann 380.*

Frequent throughout Tonga. Malaysia and Polynesia.

Tongan name: *ifi;* varietal names, *ifi mea, ifi 'ui, monosivai.*

[313] [412] [262] [824] The timber is strong and is used for general construction work, tool handles, tapa pounders, wooden drums, banana shooks, and so on. The fruit is edible.[1]

For a discussion of the reasons for using *I. edulis* as the correct name of this species rather than *I. fagiferus* (Parkinson) Fosberg, see Merrill (Chron. Bot. 14: 347, 1954).

Genus **Abrus** Linnaeus

Abrus precatorius Linnaeus, Syst., ed. 12, 472, 1767.

Subwoody, twining vine with slender, glabrous branches with long internodes. Leaves even-pinnate, alternate, leaflets subsessile, commonly 20 to 30, oblong, obtuse and slightly emarginate, base obtuse or cordulate, about 2 cm. long and 6 mm. wide. Flowers small, red or white, several, on very short, swollen, knoblike, terminal or axillary branches; pods several-seeded, seeds handsome, bright red with base black, shiny.

Tongatapu: *U.S. Expl. Exped.*

Lifuka: in seaside thicket toward northern end of island, Apr. 25, 1953, *Yuncker 15724.*

Kao: in thicket, margin of abandoned plantation, May 6, 1953, *Yuncker 15951.*

Vava'u: *Crosby;* in thicket near sea below Houma village, May 22, 1953, *Yuncker 16125.*

Niuafo'ou: in thicket in an interlaval "island" on way to upper rim of main central crater, May 16, 1953, *Yuncker 16002.*

Niuatoputapu: on edge of mountain range above Vaipoa, Dec. 5, 1951, *Hürlimann 353.*

Frequent in thickets throughout Tonga. A tropical Asiatic species now pantropic in distribution.

Tongan names: *matamoho, moho.*

[301] [824] The seeds are used for necklaces and other ornamentation.

[1] /Inocarpus edulis -- Analyst/

137 **Erythrina variegata** Linnaeus var. **orientalis** (Linnaeus) Merrill, Interpret. Herb. Amboin., 276, 1917.

Small to medium-sized, more or less spiny tree. Leaves alternate, trifoliate, long-petiolate, leaflets broadly triangular-ovate or rhombic, acute to acuminate, base truncate or acutish, up to 15 cm. long and nearly as wide, lower leaflets somewhat oblique, with prominent glands below base of petiolules. Flowers bright red, numerous, in dense, racemose clusters; pod up to 25 cm. or more long, seeds dark red.

Tongatapu: *U.S. Expl. Exped.;* in fence row near village of Niutoua, Mar. 2, *Yuncker 15115.*

'Eua: *Lister;* roadside near center of island, Mar. 19, 1953, *Yuncker 15364.*

Vava'u: in thicket near Houma village, May 22, 1953, *Yuncker 16136.*

Tafahi: near road between township of Tafahi and landing place Faihavanui, Dec. 15, 1951, *Hürlimann 543.*

Frequent throughout Tonga, often planted for use as living fence posts. India to Polynesia.

Tongan name: *ngatae.*

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The trunks are used for making canoes, for general building purposes, and for banana shooks and the like.

Genus **Strongylodon** Vogel

Strongylodon lucidus (Forster f.) Seemann, Fl. Vit., 61, 1865.

Rather coarse, climbing, woody vine. Leaves alternate, three-foliate, leaflets glabrous, oval-ovate, entire, acuminate, base obtuse, three-nerved from base, midrib branched upward, lateral leaflets somewhat oblique, up to 10 cm. long and 6 cm. wide. Flowers red, beaked; pods flattened, thick, smooth, 10 cm. long and 5 cm. wide, seeds one or two, round, black.

'Eua: in southern part of eastern ridge near summit above Vaingana, Nov. 13, 1951, *Hürlimann 269.*

Infrequent. From Ceylon to the Hawaiian Islands.

Genus **Mucuna** Adanson

Mucuna gigantea (Willdenow) de Candolle, in DC. Prodr. 2:405, 1825.

Rather slender, high-climbing, glabrous vine. Leaves alternate, three-foliate, long-petiolate, leaflets oval-ovate, lower two obliquely inequilateral, acuminate, base truncate or cordulate, up to 15 cm. or more long and 10 cm. wide, three-nerved from base, midrib branched upward, turning black upon drying. Flowers greenish, about 4 cm. long, long-pedicellate, in long-pedunculate, axillary, paniculate clusters; pods oblong, flattened, margin two-winged, covered with stinging hairs, up to 15 cm. or more long, seeds large, flattened, round or almost square.

Tongatapu: in forest tree along road between Lavengatonga village and sea, Mar. 6, 1953, *Yuncker 15187.*

'Eua: *Lister.*

Nomuka: in thicket near sea along road encircling island, Apr. 30, 1953, *Yuncker 15804.*

137 Niuatoputapu: on edge of mountain ridge above Vaipoa, Dec. 5, 1951, *Hürlimann 354.*

Frequent in thickets throughout Tonga. Southeastern Asia and Malaya to Polynesia. Now widely grown as an ornamental and as a forage crop.

Tongan names: *aka, akataha, fue'aepuaka.*

231 278 261 824 This plant[1] is said to be especially relished by swine. Parts of it are used in medicines, and the roots may be eaten in times of food scarcity.

Genus **Canavalia** de Candolle

Canavalia ensiformis (Linnaeus) de Candolle, in DC. Prodr. 2:404, 1825.

Subglabrous, subwoody vine. Leaves alternate, trifoliate, leaflets ovate or oblong-ovate, acuminate, base rounded, obtuse, up to 15 cm. long and 6 cm. wide. Flowers pink, subsessile, reflexed, in long, axillary, spikelike racemose clusters; pod about 15 cm. long and 2 cm. wide, flat.

Vava'u: *Crosby.*

A tropical American species now widespread in warm countries.

Canavalia maritima (Aublet) Thouars, in Jour. Bot. Desv. 1:80, 1813.

Rather coarse, herbaceous vine. Leaves alternate, trifoliate, leaflets rather thick, suborbicular, subovate or subobovate, obtuse, base rounded, obtuse to acute, up to 12 cm. or more long and nearly as wide, pubescent, hairs appressed. Flowers about 2 cm. long, short-pedicellate, in long-pedunculate axillary racemes, corolla pink; pods up to 10 cm. long, broadly linear, seeds brown.

'Eua: *Lister.*

Lifuka: in thicket along road to north of Pangai village, Apr. 25, 1953, *Yuncker 15714.*

Kao: in thicket, border of old plantation, May 6, 1953, *Yuncker 15958.*

Occasional throughout Tonga. A tropical American species now widely disseminated in tropical countries.

Probably the *C. obtusifolia* (Lam.) DC. of Hemsley's list.

Tongan name: *lautolu'uta.*

Canavalia microcarpa (de Candolle) Piper, Biol. Soc. Washington, Proc. 30:177, 1917.

Rather coarse, herbaceous vine. Leaves alternate, leaflets ovate, acuminate, base rounded, obtuse, up to 15 cm. long and 8-10 cm. wide. Flowers purplish or pinkish, up to 3 or 4 cm. long, short-pedicellate, few, on rather long, axillary peduncles; pods thick, three-angled on one edge, up to 12 cm. long and about 5 cm. wide, pointed, seeds ovoid, flattened, brown.

Tongatapu: *U.S. Expl. Exped.*

Southeastern Asia and Malaya to Polynesia.

C. ensiformis (L.) DC. var. *turgida* Hemsl. in Hemsley's list [?].

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[1] /Pueraria lobata -- Analyst/

Canavalia sericea A. Gray, U.S. Expl. Exped., Bot. 1 : 440, 1854.

Trailing or climbing, densely silky-pubescent vine. Leaves alternate, trifoliate, leaflets rounded-ovate to subobovate, obtuse or slightly emarginate, base acutish or obtuse, up to 9 cm. long and nearly as wide. Flowers about 3 cm. long, short-pedicellate, in axillary, racemose clusters, corolla rose-colored; pod flattened, up to about 14 cm. long, one edge three-ridged.

Tongatapu: in strand thicket, near Vaini village, Feb. 26, 1953, *Yuncker 15050;* seaward side of strand thicket above Niutoua village, Mar. 2, 1953, *Yuncker 15143;* pioneering on sand, outer edge of seaside vegetation, near Blow Hole area below Houma village, June 1, 1953, *Yuncker 16220.*

'Eua: seaward margin of strand thicket, Apr. 1, 1953, *Yuncker 15597.*

Nomuka: strand thicket above village, Apr. 30, 1953, *Yuncker 15808.*

Lifuka: spreading on sand just above high-tide limit along eastern shore of island, Apr. 27, 1953, *Yuncker 15758.*

Frequent along the outer edge of the strand vegetation throughout Tonga. Polynesia.

Tongan name: *fue tahi veveli.*

Genus **Phaseolus** Linnaeus

Phaseolus adenanthus G. W. F. Meyer, Prim. Fl. Esseq., 239, 1818.

Slender, glabrous, or somewhat pubescent, twining, herbaceous vine. Leaves alternate, trifoliate, leaflets firm, oblong-ovate or ovate, acute, base obtuse or acutish, up to 14 cm. long and 6-7 cm. wide, three-nerved from base, midrib branched upward. Flowers up to 3 cm. long, white tinged with purple, short-pedicellate, in long-pedunculate, axillary, racemose clusters, flowers few and approximated near end of peduncle; pods linear, recurved, flat, up to 10 cm. long and 1 cm. wide.

Tongatapu: *Moseley.*

Vava'u: *Crosby;* climbing in thicket along road west of Leimatua village, northwest of Neiafu, May 19, 1953, *Yuncker 16021.*

Occasional. Pantropic.

Tongan name: *fue 'uta.*

Phaseolus aureus Roxburgh, Hort. Beng., 55, 1814; Fl. India, ed. 2, 3 : 297, 1832.

Erect or climbing herb, stems furrowed and brown-pilose. Leaves alternate, trifoliate, leaflets broadly ovate, subrhomboid or suborbicular, rather thin, short-acute, stipules large, ovate. Flowers comparatively small, yellow, in clusters of four to six, at end of stout, villous peduncles; pod nearly cylindrical, up to 6-8 cm. long, somewhat curved, seeds nearly round, small, green or golden.

Vava'u: *Barclay.*

Rather widely cultivated as a vegetable or forage plant.

P. mungo L. in Hemsley's list [?]. [244]

[246]

Phaseolus semierectus Linnaeus, Mantissa 1 : 100, 1767. [824]

Erect, branching, subwoody, pubescent plant, up to 1.5 m. tall, hairs more or less reflexed, branches rather long. Leaves alternate, trifoliate, leaflets narrowly ovate or

137 oblong-ovate, acute at both ends, up to 6 or 7 cm. long and 3 cm. wide, pubescent. Flowers about 1.5 cm. long, short-pedicellate, in long-pedunculate, terminal and axillary racemose clusters, corolla purplish or dark red; pods appressed-pubescent, up to 10 cm. long and 4 mm. wide, the halves strongly twisted when opened, seeds numerous.

Tongatapu: weed in open areas on plantations, Nualei, Oct. 29, 1951, *Hürlimann 30;* in waste area near Navutoka village, Feb. 27, 1953, *Yuncker 15097;* in waste area near sea, Sopu, west of Nuku'alofa, May 30, 1953, *Yuncker 15296.*

'Eua: in old clearing near Ohonua village, Apr. 2, 1953, *Yuncker 15626.*

Frequent as a weed in waste areas throughout Tonga. A tropical American weed now pantropic in distribution.

Genus **Vigna** Savi

Vigna marina (Burmann) Merrill, Interpret. Herb. Amboin., 285, 1917.

Prostrate, subglabrous, long-trailing vine. Leaves alternate, trifoliate, leaflets round-ovate or suborbicular, apex rounded, base obtuse, up to 8 cm. long and 6 cm. wide, three-nerved from base, midrib branched upward, lateral leaflets somewhat oblique. Flowers 1.5-2 cm. long, short-pedicellate, in few-flowered racemose clusters on axillary peduncles up to 15 cm. or more long, corolla yellow; pods slender, up to 5 cm. or more long.

Tongatapu: along shore below Fu'amotu, Nov. 3, 1951, *Hürlimann 132;* pioneering in sand along seaward margin of strand vegetation, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15009.*

'Eua: *Lister;* just above high-tide level, Lokupo, Mar. 27, 1953, *Yuncker 15530.*

Lifuka: outer edge of vegetation zone near upper tidal limit, north of Pangai village, Apr. 25, 1953, *Yuncker 15720.*

Tafahi: on shore below township of Tafahi, Dec. 13, 1951, *Hürlimann 498.*

Niuatoputapu: near shore in Falehau, Dec. 18, 1951, *Hürlimann 617.*

Common along the sandy beaches throughout Tonga. Pantropic.

Tongan names: *lautolu, lautolu hina, lautolu tahi.*

[278] The leaves are used in medicines.

[824]

Genus **Dolichos** Linnaeus

Dolichos lablab Linnaeus, Sp. Pl., 725, 1753.

Vigorous, finely pubescent, twining vine. Leaves alternate, trifoliate, leaflets broadly triangular-ovate, lateral leaflets oblique, acuminate, base obtuse, three-nerved from base, midrib branched upward, up to 15 cm. long and nearly as wide, petioles up to 15 cm. or more long. Flowers about 1.5 cm. long, on slender pedicels up to 1 cm. long, in long, terminal and axillary, long-pedunculate, racemose clusters, corolla white; pods flattened, curved, up to about 10 cm. long.

Tongatapu: roadside near Nualei, Nov. 1, 1951, *Hürlimann 115; Moseley.*

Vava'u: *Crosby;* in roadside thicket between Mataika and Feletoa villages, May 19, 1953, *Yuncker 16019;* in thicket near margin of Ngofe swamp on southwestern side of island, May 19, 1953, *Yuncker 16025.*

Occasional throughout Tonga. Widely disseminated in warm countries. 137

Tongan name: *pini 'ae puaka.*

The seeds are said to be poisonous unless cooked.

Peanuts (*Arachis hypogaea* L.), garden beans (*Phaseolus* spp.), peas (*Pisum sativum* L.), and soybeans [*Glycine max* (L.) Merrill] are cultivated as plantation and garden crops. [244] [824]

FAMILY OXALIDACEAE

Genus **Oxalis** Linnaeus

Oxalis corniculata Linnaeus, Sp. Pl., 435, 1753.

Small, creeping, pubescent herb, stems ascending to 15 cm. or more. Leaves palmately compound, leaflets three, obcordate, about 1 cm. long, ciliate. Flowers yellow, in two- to six-flowered umbels, pedicels slender, 1 cm. or more long, on axillary peduncles; capsule cylindrical, up to 12 mm. or more long.

Tongatapu: *Moseley;* on rocks near sea, near Vaini, Feb. 26, 1953, *Yuncker 15052;* strand terrace near Houma, Oct. 28, 1951, *Hürlimann 15.*

'Eua: along path crossing high plateau of eastern ridge above Fuai, Nov. 9, 1951, *Hürlimann 201;* along open trail in forest near center of the island, Apr. 5, 1953, *Yuncker 15647.*

A common plantation and waste-area weed throughout Tonga. Pantropic.

Tongan name: *kihikihi.* The leaves are used in preparing medicines. [278] [824]

Genus **Averrhoa** Linnaeus

Averrhoa carambola Linnaeus, Sp. Pl., 428, 1753.

Small tree, up to about 6 m. tall. Leaves alternate, odd-pinnate, leaflets elliptic, acuminate, base acute, up to 6 cm. long and 3 cm. wide, petiolules scarcely 5 mm. long. Flowers red and white, small, in small, axillary clusters; fruit greenish yellow, waxy, up to 10 cm. or more long, strongly five-angled, fleshy, edible.

Tongatapu: in garden in Nuku'alofa, Mar. 7, 1953, *Yuncker 15220.*

Of recent introduction. A tropical American plant now widely cultivated for its fruit. [244] [824]

FAMILY RUTACEAE

Genus **Fagara** Linnaeus

Fagara pinnata (J. R. and G. Forster) Engler, in Nat. Pflanzenfam. 3(4): 119, 1896.

Tree up to 12 m. tall. Leaves alternate, even-pinnate, leaflets two to five pairs, entire, somewhat obliquely elliptic, acuminate, base shorter on one side, acute, up to 7-8 cm. long and 3 cm. wide, pinnately nerved, midrib nearer shorter side. Flowers in axillary, branching clusters up to 15 cm. long; fruit about 1 cm. long, dehiscent, one-seeded, seed black.

The leaves and bark[1] are used in medicines and in scenting coconut oil. For a discussion of this as well as other members of the Rutaceae in Tonga, Fiji, and Samoa, see A. C. Smith (Jour. Arnold Arboretum **32**: 226-255, 1951).

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Genus **Acronychia** J. R. and G. Forster

Acronychia niueana St. John, B. P. Bishop Mus., Bull. **178**: 67, fig. 3, 1943.

Shrub or small tree, up to 5 m. tall. Leaves opposite, simple, oval, obtuse or retuse, base acute, up to 20 cm. long and 10 cm. wide, minutely glandular-dotted, fragrant, petiole up to 4 cm. long. Flowers very small, white, numerous, in compound, axillary, cymose clusters; fruit subglobose, 5-7 mm. in diameter.

Tongatapu: *Setchell and Parks 15184;* near Fangahina, *Setchell and Parks 15466;* in thicket, near Vaini village, Feb. 26, 1953, *Yuncker 15047.*

Infrequent. Also in Niue.

Tongan name: *ahivao.*

Genus **Micromelum** Blume

Micromelum minutum (Forster f.) Seemann, Viti, 434, 1862.

Small tree up to 4 or 5 m. tall, the branches puberulent. Leaves pinnate, the leaflets up to 12 or more, alternate, ovate-lanceolate, acuminate, the base oblique, up to 10 cm. or more long and 7 cm. wide but mostly smaller, the petiolules about 5 mm. long. Flowers very small, white, fragrant, puberulent, in many-flowered, terminal and axillary, paniculate clusters.

Tongatapu: *Forster; Moseley;* in thicket near Vaini village, Feb. 26, 1953, *Yuncker 15048;* forest, second strand terrace below Fu'amotu, Nov. 3, 1951, *Hürlimann 138, 141.*

'Eua: *Lister;* along road between Ohonua and Pangai, Nov. 8, 1951, *Hürlimann 146.*

Nomuka: in thicket on seaward side of road encircling island between sea and inland lake, Apr. 30, 1953, *Yuncker 15814.*

Lifuka: in seaside thicket north of Pangai village, Apr. 25, 1953, *Yuncker 15748;* in thicket at northern end of island near Lifuka end of the interisland causeway, May 11, 1953, *Yuncker 15983.*

Vava'u: *Crosby;* on forested slope leading down to Lake Anovai, May 19, 1953, *Yuncker 16044.*

Tafahi: fog forest below top of Piu 'o Tafahi, alt. 590 m., Dec. 10, 1951, *Hürlimann 435.*

Frequent throughout Tonga. From southern Asia through Malaya to Polynesia.

M. pubescens Blume var. *glabrescens* Oliv. in Hemsley's and Burkill's lists.

Tongan names: *takafalu, takafalu hina.*

[1] /Evodia hortensis -- Analyst/

Genus **Citrus** Linnaeus

137 **Citrus maxima** (Burmann) Merrill, Interpret. Herb. Amboin., 296, 1917.

Tree up to 10 m. tall, branches spiny, twigs compressed, green. Leaves elliptic or ovate-oblong, entire, apex retuse, up to 10-12 cm. long, the petioles obovate-winged. Flowers white, fragrant, several, in short, axillary racemes; the fruit up to 15 cm. or more in diameter, the rind thick, the pulp yellow or reddish, rather dry, scarcely edible.

Occasional in forests and thickets throughout Tonga. Not seen in cultivation.

C. decumana L. of Hemsley's list.

Tongan name: *moli tonga.*

245 Oranges (*moli kai*), limes (*laime*), citrons, mandarins (*moli peli*), kumquats, grapefruit (*moli kalepi*), and lemons (*lemani*) are cultivated. Lemons
82 are often found growing naturally. A number of large fruiting trees occur in
302 the forest above Fuai plantation on the island of 'Eua. *Moli uku,* a form producing inedible fruit sometimes used for washing hair, was reported but not seen.

FAMILY SIMAROUBACEAE

Genus **Suriana** Plumier

Suriana maritima Linnaeus, Sp. Pl., 284. 1753.

Shrub or small tree up to 3 m. or more tall, the younger parts and leaves finely pubescent. Leaves alternate but closely spaced, simple, linear-spatulate, very shortly acutish, gradually narrowed to short petiole, up to about 3 cm. long and 3-5 mm. wide. Flowers yellow, in subterminal, racemose clusters, petals about 8 mm. long; capsule five-parted, pubescent.

Tongatapu: forming thicket near beach below Fu'amotu village, Mar. 4, 1953, *Yuncker 15193.*

'Eua: in sandy soil just above high-tide limit, Ha'aluma, Apr. 1, 1953. *Yuncker 15594.*

Lifuka: *Harvey;* in thin soil on rocky cliff along northern end of island. May 11, 1953, *Yuncker 15982.*

Islets near Vava'u: *Crosby.*

Niuatoputapu: on coral sand, coast south of Matavai, Dec. 26, 1951. *Hürlimann 628.*

Common in strand thickets on most of the islands of Tonga. Pantropic.

Tongan name: *ngingie.*

FAMILY BURSERACEAE

Genus **Canarium** Linnaeus

Canarium harveyi Seemann, Fl. Vit., 35, 1865.

Tree up to 12 m. or more tall. Leaves alternate, pinnate, leaflets oval-oblong or ovate, entire, somewhat glossy, acuminate, base rounded, obtuse, up to 15 cm. long, pinnately

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nerved, with numerous fine, anastomosing nervules, petiolules up to 2.5 cm. long, petiole 5-7 cm. or more long. Flowers small, greenish orange, in branching, terminal clusters; fruit ovoid, drupaceous, 2 cm. or more long, seed edible.

'Eua: *Lister;* in thinly forested area back of Pangai village, on way to Fuai, Mar. 25, 1953, *Yuncker 15487;* in forest on eastern ridge above Fuai, alt. 150 m., Nov. 9, 1951, *Hürlimann 193.*

Vava'u: *Harvey; Crosby;* in forest at upper rim of coastal cliff along northwest coast, May 25, 1953, *Yuncker 16181.*

Occasional. Also known on Niue Island.

Tongan name: *'ai.*

Canarium samoense Engler, in DC. Monogr. Phanerog. 4: 134, 1883.

Large tree, up to 14 m. or more tall, bark and wood somewhat fragrant. Leaves alternate, pinnate, leaflets elliptic-lanceolate, acuminate, base acute, margin minutely uneven, pinnately nerved.

Kao: on steep rocky slope in open forest, about 180 m. alt., Apr. 30, 1953, *Yuncker 15966.*

This specimen is sterile and the report, which is new for Tonga, should be considered provisional. Also in Samoa.

Tongan name: *makai.*

The timber is used for canoe construction and in general building; the fragrant parts, for scenting oil. [396] [313] [303] [824]

Genus **Garuga** Roxburgh

Garuga floribunda Decaisne, Mus. Hist. Nat. Paris, Nouv. Ann. 3: 477, 1834.

Tree, up to 8 or 10 m. or more tall. Leaves alternate, hairy, pinnate, leaflets elliptic- or ovate-lanceolate, acuminate, base rounded, somewhat inequilaterally oblique, crenate-serrate, up to 13 cm. or more long and 5 cm. wide, pinnately nerved, petiolules scarcely 5 mm. long, petioles up to 8 cm. or more long. Flowers small, numerous, in paniculate clusters up to 15 cm. or more long, inflorescence parts puberulent; fruit 1 cm. or more thick.

Tongatapu: forest margin, below Niutoua village, Mar. 2, 1953, *Yuncker 15114;* near Nuku'alofa, 1926, *Setchell and Parks 15313.*

'Eua: clearing near Ohonua village, Apr. 2, 1953, *Yuncker 15634.*

Lifuka: near dwelling, Pangai village, Apr. 28, 1953, *Yuncker 15794.*

Vava'u: *Crosby 291;* in open forest near eastern coast below Houma village, May 22, 1953, *Yuncker 16129.*

Occasional throughout Tonga. Widespread from the Philippines and Java to Samoa, but not recorded from Fiji. Lam (Jard. Bot. Buitenzorg, Bull. III, 12: 329, 1932) indicates that *G. pacifica* Burkill (Linn. Soc. Bot., Jour. 35: 30, 1901) is to be reduced to the widespread *G. floribunda.*

Tongan name: *manaui.*

The timber is used in general construction work. [313] [824]

Fuai plantation, Mar. 19, 1953, *Yuncker 15353;* on limestone cliff facing sea near summit of eastern ridge, Lokupo district, Apr. 8, 1953, *Yuncker 15674;* near eastern ridge cliff, alt. 220 m., Nov. 9, 1951, *Hürlimann 202.*

Kao: in open forest on lower slope, May 6, 1953, *Yuncker 15971.*

Vava'u: *Barclay; Crosby; MacDaniels;* in thicket on cliff near sea below Houma village, May 22, 1953, *Yuncker 16126.*

Frequent throughout Tonga. Limited to Fiji and Tonga.

Tongan names: *ahivao, takafalu'uli.*

Genus **Melia** Linnaeus

Melia azedarach Linnaeus, Sp. Pl., 384, 1753.

Small tree. Leaves alternate, twice-pinnate, leaflets ovate, acuminate, base acute, serrate, opposite, up to 5 cm. or more long, glabrous. Flowers numerous, small, in loose axillary panicles, fragrant, showy, corolla violet or lavender; fruit fleshy, subglobose, yellow, about 1.5 cm. in diameter.

'Eua: *Lister;* grove east of road between villages of Pangai and Ohonua, Apr. 2, 1953, *Yuncker 15631.*

Vava'u: *Crosby.*

Presumably introduced as an ornamental but occasionally adventive. A Chinese species widely planted in warm countries.

Tongan name: *sita.*

The wood is of some use for handicraft work.

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Genus **Dysoxylum** Blume

Dysoxylum forsteri (Jussieu) C. de Candolle, in DC. Monogr. Phanerog. **1**: 507, 1878.

Tree, up to 10 m. or more tall, young growth puberulent glabrescent. Leaves alternate, even-pinnate, up to 50 cm. or more long, leaflets oblong-elliptic or elliptic-lanceolate, acuminate, base inequilaterally oblique, up to 12 cm. long and 4-5 cm. wide, petiolules 2-3 mm. long. Flowers mostly less than 1 cm. long, sessile or short-pedicellate, in compound, racemose, axillary clusters, peduncle finely pubescent; fruit subglobose, about 2 cm. in diameter, brown with whitish scurfy patches.

Tongatapu: *Graeffe; Setchell and Parks; MacDaniels;* open forest near village of Niutoua, Mar. 2, 1953, *Yuncker 15117.*

'Eua: *Parks;* open forested area on seaward side of main road between villages of Pangai and Ohonua, Apr. 2, 1953, *Yuncker 15632.*

Nomuka: clearing on lakeward side of road encircling island, Apr. 30, 1953, *Yuncker 15860.*

Vava'u: *Barclay; Crosby;* about 1 mile along road leading to coastal cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16111.*

Frequent throughout Tonga in open forested areas. Also in Niue.

D. richii (A. Gr.) DC. *sensu* Hemsley's list and Yuncker (B. P. Bishop Mus., Bull. **178**: 71, 1943), not DC.

Tongan name: *mo'ota.*

137 The plant[1] parts when crushed have a somewhat disagreeable odor said to
278 resemble that of fruit bats (flying foxes). The leaves are used medicinally and
757 an extract of the leaves is used for wetting tapas to cover the body "in cases
396 of weakness." The wood is used in making canoes and banana shooks and
415 for general building purposes.

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824 **Dysoxylum tongense** A. C. Smith, U.S. Nat. Herb., Contrib. 30: 509, 1952.

Large tree, up to 10 m. or more tall, branchlets stout and with large, rounded leaf scars. Leaves even-pinnate, up to 25 cm. or more long, leaflets elliptic-ovate, acute, base obliquely inequilateral, up to 15 cm. long and 8 cm. wide, glabrous, pinnately nerved, petiolules about 1 cm. long. Flowers small, sessile, in axillary, paniculate clusters up to 12-14 cm. long, parts of inflorescence puberulent, corolla greenish white.

'Eua: *Parks;* in forest above Fuai plantation, Mar. 18, 1953, *Yuncker 15316;* edge of forest near center of island, Mar. 18, 1953, *Yuncker 15336;* Mar. 19, 1953, *Yuncker 15366;* Apr. 7, 1953, *Yuncker 15662.*

So far as I know, this species is restricted to 'Eua Island above about 100 m. altitude.

Tongan name: *mo'ota kula.*

313 The wood is used in handicraft work.

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Genus **Aglaia** Loureiro

Aglaia heterotricha A. C. Smith, U.S. Nat. Herb., Contrib. 30: 486, 1952.

Tree with slender branches, branchlets, petioles, and lower leaflet surface scaly-hairy. Leaves odd-pinnate, leaflets seven, elliptic, up to 25 cm. long and 10 cm. wide, obtuse, base obtuse or acute, petiolules up to 17 mm. or more long, petiole 15-20 cm. long, conspicuously swollen at base. Flowers about 2 mm. long, on slender, short pedicels, in freely branched, axillary, paniculate clusters, the stamen filaments united into a pilose tube.

'Eua: central plateau, June or July 1926, *Parks 16305,* type collection. Known only from 'Eua.

Aglaia saltatorum A. C. Smith, U.S. Nat. Herb., Contrib. 30: 483, 1952.

Shrub or tree, up to 10 m. tall, twigs and young parts pubescent, hairs brown, stellate. Leaves odd-pinnate, leaflets mostly seven, essentially opposite, elliptic or oblong-elliptic, apex acute or rounded, base inequilateral, obtuse or acute, up to 15 cm. long and 8 cm. wide, pinnately nerved. Flowers small, about 2 mm. long, numerous, in rather large, axillary, paniculate clusters; fruit subglobose or ellipsoidal, about 2 cm. long, brown, stellately pubescent.

Tongatapu: *Setchell and Parks; McKern;* in seaside forest below village of Niutoua, Mar. 2, 1953, *Yuncker 15138.*

'Eua: in rich forest above Fuai plantation, Mar. 18, 1953, *Yuncker 15313.*

Nomuka: above village in clearing near sea, Apr. 30, 1953, *Yuncker 15857.*

Lifuka: along road north of Pangai village, Apr. 25, 1953, *Yuncker 15738.*

Vava'u: *Crosby.*

Niuatoputapu: on coral soil near dwelling, Jan. 2, 1952, *Hürlimann 649.*

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[1] /Dysoxylum forsteri -- Analyst/

Rather frequent throughout Tonga. Also in Fiji and Niue.

Aglaia sp. in Burkill's list.

Tongan name: *langakali.* -

The flowers are used for leis and for scenting oil.[1]

For a discussion of the Fijian, Samoan, and Tongan members of the Meliaceae, see A. C. Smith (U.S. Nat. Herb., Contrib. **30**: 469-522, 1952).

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FAMILY DICHAPETALACEAE

Genus **Dichapetalum** Thouars

Dichapetalum vitiense (Seemann) Engler, in Engler and Prantl, Nat. Pflanzenfam. **3**(4): 348, 1897.

High-climbing, woody vine, the young twigs puberulous. Leaves alternate, elliptic-subovate or subobovate, acuminate, base rounded, obtuse or acute, sometimes inequilateral, entire, up to 15 cm. or more long and 7 cm. wide, pinnately nerved, finely venulose as viewed by transmitted light. Flower buds yellow-hairy; fruit obovoid, 1-2 cm. in diameter, densely puberulent.

'Eua: canyon of Lakatoha River near Ohonua, Nov. 10, 1951, *Hürlimann 247.*

Vava'u: in forest near summit of ridge, Mo'ungalafa, May 27, 1953, *Yuncker 16203;* near Neiafu, Aug. 1926, *Setchell and Parks 15654.*

Infrequent. Also in Fiji.

Tongan name: *tuamea.*

Said to be poisonous.

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FAMILY EUPHORBIACEAE

Genus **Phyllanthus** Linnaeus

Phyllanthus niruri Linnaeus, Sp. Pl., 981, 1753.

Branching, slender-stemmed, glabrous plant, up to 30 cm. or more tall, subwoody at base. Leaves alternate, along very slender branches, paler beneath, oblong-subspatulate, somewhat oblique, obtuse, base subacute, up to about 1 cm. long and 3 or 4 mm. wide, subsessile on very short petioles. Flowers very small, white, pendent beneath branches on short, slender, axillary pedicels; fruit small, depressed-globose.

Tongatapu: ballast weed, *Setchell and Parks 15329.*

Lifuka: in sandy soil, clearing near beach north of Pangai village, Apr. 25, 1953, *Yuncker 15719.*

Niuatoputapu: in cultivated area above Hihifo toward mountain range, alt. 30 m., Dec. 5, 1951, *Hürlimann 329.*

Occasional. A pantropic weedy plant.

Phyllanthus simplex Retzius, Observ. Bot. **5**: 29, 1789.

Slender, glabrous, branching plant, up to 60 cm. tall, slightly woody at base. Leaves numerous, alternate, elliptic-oblong, acutish with a short, mucronate tip, up to about 2 cm.

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[1] /Aglaia saltatorum -- Analyst/

137 long and 6 mm. wide, subsessile. Flowers very small, solitary, on slender, axillary pedicels; capsule small, subglobose, three-parted.

Tongatapu: *Cook;* waste area near village of Niutoua, Mar. 2, 1953, *Yuncker 15125.*

'Eua: *Lister;* in open area near edge of forest above Fuai plantation, Mar. 19, 1953. *Yuncker 15339.*

Tafahi: along road between township of Tafahi and landing place Faihavanui, alt. 70 m., Dec. 15, 1951, *Hürlimann 527.*

Niuatoputapu: roadside between Falehau and the southeast coast, alt. 10 m., Dec. 7, 1951, *Hürlimann 397.*

Frequent throughout Tonga. Southern Asia and Malaysia to Micronesia and Polynesia.

Genus **Glochidion** Forster

Glochidion concolor Mueller-Argoviensis, Linnaea 32: 62, 1863.

Tree, up to 7-8 m. or more tall, branchlets slender, glabrous. Leaves alternate, two-ranked, elliptic, acuminate, base acute, up to 10-12 cm. long and 4-5 cm. wide, paler beneath, pinnately nerved, entire, petiole up to 5 mm. long. Flowers small, on pedicels up to 5 mm. long, in several-flowered, axillary fascicles; fruit depressed-oblate, grooved.

'Eua: margin of forest near center of island, Mar. 19, 1953, *Yuncker 15363;* in open forest north of Fuai plantation, Apr. 5, 1953, *Yuncker 15648.*

Lifuka: in thicket near sea, north of Pangai village, Apr. 25, 1953, *Yuncker 15729.*

Vava'u: side of trail on way to summit of Talau, west of Neiafu, May 23, 1953, *Yuncker 16148.*

Rather frequent throughout Tonga. Also in Fiji.

Tongan name: *malolo.*

278 An extract of the leaves is used in preparing medicines.

824 **Glochidion ramiflorum** Forster f., Fl. Ins. Australia, Prodr., 361, 1786.

Medium to large tree, up to 18 m. tall, branchlets glabrous. Leaves alternate, two-ranked, elliptic, acuminate, base acute, up to 12-14 cm. long and 6 cm. wide, entire, petiole about 5 mm. long, narrowly winged by decurrent blade margins. Flowers small, on slender pedicels up to 1 cm. long, in few-flowered, axillary fascicles; fruit depressed-oblate, grooved.

Tongatapu: in swampy area near village of Navutoka, Feb. 25, 1953, *Yuncker 15071;* along trail through thicket below Nualei village, Mar. 9, 1953, *Yuncker 15233.*

'Eua: *Lister;* in moist ravine forest near center of island, Mar. 18, 1953. *Yuncker 15321.*

Nomuka: in thicket near sea along road encircling island, Apr. 30, 1953. *Yuncker 15862.*

Lifuka: in thicket near beach, along coast north of Pangai village, Apr. 25, 1953, *Yuncker 15717.*

76: Yuncker N-4,5 (1953) 1959 OU9 Tonga OU9

Vava'u: *Crosby.*

Niuafo'ou: thicket just above upper margin of recent lava flow, May 16, 1953, *Yuncker 15989.* 137

Frequent throughout Tonga. New Hebrides eastward to [?] Samoa.

Phyllanthus ramiflorus Muell. Arg. in Hemsley's list and *P. ramiflorus* var. *genuinus* Muell. Arg. in Burkill's list.

Tongan names: *malolo, misikoka.*

The leaves and bark are used in preparing medicines.[1] 278 824 113

For a discussion of the taxonomic status and distribution of *G. concolor* and *G. ramiflorum* see Croizat (Sargentia 1: 47, 1942).

Genus **Bischofia** Blume

Bischofia javanica Blume, Bijdr. Fl. Java, 1168. 1826.

Tree, up to 10 m. or more tall, branchlets and leaves glabrous. Leaves alternate, three-foliate, leaflets ovate-elliptic, acuminate, base acute, up to 15 cm. long and 8 cm. wide, crenate-dentate, terminal leaflet long-stalked, lateral leaflets on petiolules 1-1.5 cm. long. Flowers small, dioecious, numerous, in axillary, panicled racemose clusters; fruit globose, fleshy, up to about 1 cm. in diameter.

Tongatapu: *Moseley;* thicket near Hufangalupe, Feb. 26, 1953, *Yuncker 15042;* near dwellings, Ma'ofanga, Nov. 23, 1951, *Hürlimann 313;* near Nualei, Dec. 26, 1951, *Hürlimann 677.*

'Eua: in forested area near center of island, Mar. 18, 1953, *Yuncker 15313;* in forest along creek above Fuai, alt. 90 m., Nov. 8, 1951, *Hürlimann 164.*

Nomuka: thicket near shore of lake, along road encircling island, Apr. 30, 1953, *Yuncker 15856.*

Lifuka: in thicket between road and beach, north of Pangai village, Apr. 25, 1953, *Yuncker 15715.*

Vava'u: *Crosby;* in thicket along road between Houma village and sea, May 22, 1953, *Yuncker 16122.*

Common throughout Tonga. India, China, and Malaysia to Polynesia.

[?] Including *B. leptopoda* Muell. Arg. *sensu* Hemsley's list.

Tongan name: *koka.*

The bark furnishes a dye used in coloring tapa; the stems are used for posts and so forth. 386 313 417 824

Genus **Claoxylon** Jussieu

Claoxylon parvicoccum Croizat, Sargentia 1: 49, 1942.

Tree up to 8 m. or more tall, the branchlets and leaves glabrous. Leaves alternate, elliptic-ovate, acuminate, the base acute to long-cuneate, 12-15 cm. or more long and 5-8 cm. wide, sharply crenately toothed, pinnately nerved, the petiole up to 8 cm. or more long. Flowers unisexual, in slender, spicate clusters.

[1] /Glochidion ramiflorum -- Analyst/

137 'Eua: *Parks 16262* [cited by Croizat]; forested area near center of island, Mar. 18, 1953, *Yuncker 15322*.

Infrequent. Also in Fiji.

Genus **Macaranga** Thouars

Macaranga harveyana (Mueller-Argoviensis) Mueller-Argoviensis, in DC. Prodr. 15(2): 998, 1866.

Small, soft-wooded, dioecious tree, up to 8 m. or more tall, branchlets stout, pithy. Leaves alternate, peltate, round-ovate, acuminate, very shallowly toothed or entire, paler and golden glandular-dotted beneath, about eight-nerved from petiole, midrib branched upward, up to 20 cm. or more long and 18 cm. wide, commonly somewhat smaller, petioles up to 15 cm. or more long, stipules lanceolate, long-acuminate, up to 2 cm. long. Flowers small, in axillary, paniculate-racemose clusters; fruit depressed-globose, soft-spiny, about 1 cm. in diameter.

Tongatapu: *Moseley;* thicket along road near Vaini village, Feb. 26, 1953, *Yuncker 15053* (male), *15065* (female).

'Eua: *Lister;* margin of old plantation between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15482*.

Lifuka: thicket near northern end of island near Lifuka end of interisland causeway, May 11, 1953, *Yuncker 15980*.

Kao: lower margin of forest near old plantation, May 6, 1953, *Yuncker 15960*.

Vava'u: *Crosby;* in clearing on slope above the lagoon at Vaihoi, May 26, 1953, *Yuncker 16200*.

Tafahi: forest along path to Piu 'o Tafahi, alt. 150 m., Dec. 10, 1951, *Hürlimann 406*.

Frequent throughout Tonga. Fiji, Niue, and Samoa to the Society Islands.

Tongan name: *loupata*.

313
342
322
415
251
278
854
824

The timber is used for house construction, handicraft work, banana shooks, and other purposes; the leaves, for covering *umu* (ovens), for wrapping fish, and in medicines used for stomach disorders in infants.

Macaranga seemannii (Mueller-Argoviensis) Mueller-Argoviensis, in DC. Prodr. 15(2): 999, 1866.

Tree up to 18 m. tall, branchlets and petioles subglabrous. Leaves alternate, broadly ovate, long-acuminate, base rounded, peltate 2.5-7.5 cm. from margin, six- to eight-nerved from petiole, glandular beneath, nerves beneath puberulent, up to 30 cm. long and 22 cm. wide but commonly somewhat smaller, petiole up to 18 cm. long, stipules oblong-lanceolate, up to 4 cm. long and 1 cm. wide. Flowers small, in axillary, paniculate clusters up to 12 cm. long; fruit smooth, glandular.

Tongatapu: *Cook; U.S. Expl. Exped.*

Infrequent. Also in Fiji.

Genus **Acalypha** Linnaeus

Acalypha boehmerioides Miquel, Fl. Ind. Bat., Suppl., 459, 1860. 137

Small, finely pubescent, semi-woody plant, branching from base, up to 60 cm. or more tall but mostly somewhat shorter. Leaves alternate, ovate, acute, the base obtuse or acutish, three- or five-nerved from base, midrib branched upward, up to 3 cm. or more long and 2.5 cm. wide, crenate, nerves often reddish, petiole slender, up to 3 cm. long. Flowers small, greenish, in spicate, axillary clusters.

Vava'u: *Crosby.*

Niuatoputapu: south of Falehu toward southeast coast, Dec. 7, 1951, *Hürlimann 396.*

Occasional as a weed. Malaysia to Polynesia.

Tongan name: *hongohongo.*

Acalypha grandis Bentham, in Hook. London Jour. Bot. 2: 232, 1843.

Shrub or small tree up to 4 m. or more tall, young branches canescent-pubescent. Leaves alternate, broadly ovate, acuminate, base rounded, obtuse or cordate, coarsely dentate, up to 15 cm. or more long, minutely pellucid-dotted, palmately nerved, petiole mostly 5-12 cm. long. Inflorescences unisexual, male spikes 7-12 cm. or more long, female spikes usually much longer; capsule pubescent.

Tongatapu: *Home.*

Samoa, Fiji, and probably westward to Malaysia.

Acalypha hispida Burmann f., Fl. India, 303, pl. 61, fig. 1, 1768.

Shrub, up to 2 m. tall, branches pubescent. Leaves alternate, ovate, toothed, up to 10 cm. or more wide, acuminate. Flowers in red, cylindrical, axillary catkins up to 20 cm. or more long.

Introduced ornamental, occasional in villages. An East Indian species now widely cultivated in warm countries. 245 824

Acalypha insulana Mueller-Argoviensis, Flora 47: 439, 1864, var. **insulana.**

Rather densely spreading-pilose shrub up to 5 m. or more tall. Leaves alternate, ovate, elliptic or lanceolate, two or more times longer than wide, acuminate, base subcordate to acute, pinnately nerved, petiole up to 7 cm. long. Inflorescences spicate, unisexual, bracts dentate, hairy; fruit densely hairy.

Tongatapu: *Moseley.*

Infrequent. Fiji and presumably westward, at least to New Guinea.

Acalypha repanda Mueller-Argoviensis, Flora 47: 439, 1864, var. **repanda.**

Shrub up to 5 m. tall, young branches puberulent. Leaves alternate, elliptic or elliptic-ovate, acuminate, base rounded, obtuse or cordulate, up to 15-20 cm. or more long and 9-10 cm. wide, pinnately nerved, crenulate, petiole up to 7 cm. or more long. Flowers very small, in axillary, spicate clusters.

'Eua: in deep forest near summit of eastern ridge, Mar. 30, 1953, *Yuncker 15560.*

Infrequent. New Guinea eastward to Samoa.

137 **Acalypha wilkesiana** Mueller-Argoviensis, in DC. Prodr. 15(2): 817, 1866.

Shrub, up to 2 m. or more tall, branches pubescent. Leaves mostly ovate, serrate, up to 20 cm. or more long and 15 cm. wide, acuminate, pubescent, mottled with various shades of red, yellow, and bronzy green. Flowers monoecious, small, on slender, axillary spikes up to 15 cm. or more long.

[245] [824] Introduced ornamental, frequently used as a hedge plant. Widely cultivated in warm countries. Although the type is from Fiji, the actual origin of the species is questionable.

Tongan name: *kalakala 'apusi.*

Genus Ricinus Tournefort

Ricinus communis Linnaeus, Sp. Pl., 1007, 1753.

Large, coarse, semi-woody, glabrous shrub or small tree with spreading, hollow branches. Leaves alternate, round-ovate in outline, peltate, mostly deeply palmately five- to nine-lobed, lobes sharply acuminate, serrate, up to 20 cm. or more long and as wide, palmately nerved, petiole about as long as blade. Flowers monoecious, small, in large terminal or axillary paniculate clusters; capsules three-seeded, spiny, seeds about 1 cm. long, smooth, variegated.

Tongatapu: *Moseley;* edge of old plantation near Niutoua village, Mar. 2, 1953, *Yuncker 15110.*

'Eua: in waste area near village of Ohonua, Apr. 2, 1953, *Yuncker 15618.*

Vava'u: *Crosby.*

Occasional in waste areas throughout Tonga. A native of the Old World, now pantropic in distribution.

Tongan name: *lepo.*

[251] The leaves are used for wrapping shellfish.

Genus Aleurites Forster

Aleurites moluccana (Linnaeus) Willdenow, Sp. Pl. 4: 590, 1805.

Tree up to 10 m. or more tall, branches, leaves and inflorescence brown-stellate-scurfy. Leaves light green, alternate, ovate or ovate-lanceolate, acute, base truncate or cordulate, entire, or palmately three- or five-lobed, lobes triangular, acute, three- to five-nerved from base, midrib branched upward, up to 20 cm. or more long and 15 cm. wide but mostly somewhat smaller, petiole as long as or longer than blade. Flowers small, greenish yellow or white, in large, many-flowered, terminal, paniculate clusters; fruit about 5 cm. in diameter when mature, subglobose.

Tongatapu: *Moseley; Forster;* margin of coastal forest, near Vaini village, Feb. 26, 1953, *Yuncker 15058.*

'Eua: *Lister;* along trail between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15460;* toward eastern ridge, near Fuai, alt. 60 m., Nov. 8, 1951, *Hürlimann 157.*

Lifuka: about midisland along road between Pangai village and east coast, Apr. 27, 1953, *Yuncker 15754.*

Vava'u: *Crosby:* in thicket along road near sea below the village of Houma, May 22, 1953, *Yuncker 16135.* 137

Frequent throughout Tonga. Southern Asia and Malaysia to Polynesia.

Tongan name: *tuitui.*

An extract of the bark is used for dyeing, and oil obtained from the fruit is used in a number of ways. [386] [824] ●

Genus **Jatropha** Linnaeus

Jatropha curcas Linnaeus, Sp. Pl., 1006, 1753.

Glabrous shrub or small tree up to 5 or 6 m. tall. Leaves alternate, round-ovate, three- or five-lobed, lobes acuminate, base cordate with broad sinus, palmately seven-nerved, midrib and lateral nerves strongly branched upward, 15 cm. or more long and as wide, petiole commonly longer than blade. Flowers greenish-white, 6-8 mm. wide, in axillary, pedunculate, cymose clusters; capsule up to 3 cm. long.

Tongatapu: in thicket near village of Niutoua, Mar. 2, 1953, *Yuncker 15116.*

'Eua: in thicket near Ohonua, Apr. 2, 1953, *Yuncker 15637.*

Lifuka: along road about midisland between Pangai village and eastern side of island, Apr. 27, 1953, *Yuncker 15774.*

Vava'u: *Crosby.*

Frequent throughout Tonga. A tropical American species now of pantropic distribution.

Tongan name: *fiki.*

Often grows in rows about plantations, along roads, and other places where it is used as living fence posts. An extract of the leaves is used in preparing medicines. [824] [245] [278]

Jatropha multifida Linnaeus, Sp. Pl., 1006, 1753.

Shrubs or small tree up to about 6 m. tall. Leaves nearly round in outline but deeply divided into seven to 11 lobes, the lobes entire or incised, glabrous. Flowers bright red, in compound, cymose clusters.

Tongatapu: *Setchell and Parks 15548.*

Occasional in villages. A native of tropical America, now widely planted as an ornamental.

Tongan name: *fiki papalangi.*

Genus **Manihot** Tournefort

Manihot esculenta Crantz, Inst. Rei Herb. 1: 167, 1766.

Glabrous, half-woody, shrubby plant, up to about 2 m. tall. Leaves alternate, paler beneath, deeply palmately parted into three to seven lanceolate, entire, acuminate divisions, up to 20 cm. or more long and about as wide. Flowers monoecious, about 2 cm. wide, yellowish-green or reddish, in few-flowered, axillary, paniculate clusters, often not developing; fruit subglobose, about 1.5 cm. in diameter, ridged.

137 244 824 262 Cultivated[1] throughout the group for its edible roots. A tropical American species now of pantropic cultivation.

Tongan name: *manioke*. The following varieties are recognized:

Manioke falaoa: stem is pale green, the tuber white.

Manioke hina: stem and leaves are pale green; the skin of the tuber is brown without, pink within.

Manioke koka'anga: stem is dark red, the leaves dark violet, the skin of the tuber is red; the tuber is bitter unless properly prepared and is used to prepare an adhesive paste.

Manioke leka hina: stem and leaves are pale green, the tuber white.

Manioke leka kula: stem is light brown, the petiole red, and the skin of the tuber dark red.

Genus **Codiaeum** Jussieu

Codiaeum variegatum (Linnaeus) Blume, Bijdr. Fl. Java, 606, 1825.

Densely branched, glabrous shrub. Leaves alternate, varying greatly in shape and size, commonly entire, sometimes interrupted or twisted, pinnately nerved, mostly acuminate, variegated green, red, pink, yellow, and white. Flowers small, monoecious, in axillary, racemose clusters.

'Eua: *Lister.*

Tafahi: in cemetery beneath the township of Tafahi, alt. 30 m., Dec. 17, 1951, *Hürlimann 594.*

245 824 Cultivated as an ornamental throughout Tonga. Pantropic.

Genus **Croton** Linnaeus

Croton storckii Seemann, Bonplandia 10: 297, 1862.

Shrub with sparse, stellate pubescence glabrescent. Leaves alternate, ovate, short-acuminate, base rounded, bi-glandular, up to 10 cm. long and 5 cm. wide, the petiole up to 2.5 cm. long. Flowers small, in terminal, racemose clusters up to 5 cm. long.

Vava'u: *Crosby 150.*

Also in Fiji.

C. microtiglium Burkill (Linn. Soc. Bot., Jour. 35: 54, 1901). See also the note by A. C. Smith (B. P. Bishop Mus., Bull. 141: 83, 1936).

Genus **Excoecaria** Linnaeus

Excoecaria agallocha Linnaeus, Syst., ed. 10, 1288, 1759.

Tree up to 10 or 12 m. tall, the latex white, adhesive, irritating. Leaves alternate, glabrous, oval or oval-obovate, acutish or rounded and retuse, base obtuse to acutish, bi-glandular, up to 8 cm. or more long and 6-7 cm. wide, pinnately nerved, lateral nerves slender and inconspicuous, petiole up to 2 cm. long. Flowers monoecious, small, male flowers in many-flowered, axillary spikes up to 5 cm. or more long, female flowers in axillary racemes up to 3 or 4 cm. long; capsules subglobose, about 5 mm. in diameter.

Tongatapu: *Cook; Home;* in thicket, Sopu, Feb. 25, 1953, *Yuncker 15025;* in swampy area near Navutoka village, Feb. 27, 1953, *Yuncker 15072;* near Fatai toward sea, Oct. 30, 1951, *Hürlimann 62.*

[1] /Manihot esculenta -- Analyst/

137

Euphorbia prostrata Aiton, Hort. Kew. 2 : 136. 1789.

Low, prostrate, widely spreading, slender-stemmed herb. Leaves small, opposite, oval-obovate, obtuse, base obtusely obliquely inequilateral, serrulate. Flowers minute, in small axillary clusters.

Tongatapu : in sandy waste area, Navutoka village, Feb. 27, 1953, *Yuncker 15090.*

'Eua: in waste area near center of island. Apr. 5. 1953, *Yuncker 15645.*

Frequent as a lawn weed about dwellings and in waste areas throughout Tonga. Pantropic.

Euphorbia pulcherrima Willdenow. ex Klotz. in Otto and Dietrich, Allgem. Gartenz. 2 : 27, 1834.

Erect, glabrous, branching, soft-wooded shrub, up to 2 m. or more tall. Leaves elliptical or elliptic-ovate, acute, entire or sinuate-toothed or lobed, pubescent, up to 25 cm. or more long and 15 cm. wide, on petioles up to about 8 cm. long, upper leaves near inflorescence commonly lanceolate and bright red. Flowers comparatively small and inconspicuous, yellow and reddish green.

Cultivated throughout Tonga as an ornamental. A native of Mexico now widely cultivated in warm countries. [245] [824]

Tongan name: *lave'imoa.*

Euphorbia ramosissima Hooker and Arnott, Bot. Beechey Voy., 69, 1832.

Small, subwoody plant with short, thickened. decumbent stems and numerous, slender, ascending branches. Leaves oval-ovate, obtuse, base obliquely rounded, cordulate, up to 1 cm. long, entire, petiole about 2 mm. long. Flowers small, white, in small, axillary clusters.

'Eua: *Lister.*

Vava'u: *Crosby.*

Tafahi: on rocks near shore, Fakafafa moe Tauloto, Dec. 17, 1951, *Hürlimann 609.*

Occasional. Also in Fiji and Niue.

Includes *E. sparmannii* Boiss. of Hemsley's list.

Genus Breynia Forster

Breynia nivosa (Bull) Small, Torrey Bot. Club, Bull. 37 : 516, 1910.

Shrub or small tree with glabrous, spreading, two-ranked branches. Leaves alternate, two-ranked, oval-ovate, entire, variegated with yellow and red, obtuse or abruptly pointed, petioles short, stipules very small, triangular-acute. Flowers monoecious, small, green, on short, axillary pedicels.

Occasional as a hedge plant in villages. A species of the south Pacific now widely cultivated as an ornamental in warm countries. [245] [824]

Genus **Securinega** Jussieu

137 **Securinega samoana** Croizat, B. P. Bishop Mus., Bull. 184: 45, 1945.

Small to medium-sized tree up to 10 m. tall. Leaves alternate, elliptic or elliptic-subobovate, glabrous, acuminate, base subacute, pinnately nerved, nerves six to eight on each side, up to 12 cm. or more long and 6 cm. wide, on petioles scarcely 1 cm. long. Flowers white, very small, numerous, on pedicels about 5 mm. long, in axillary clusters; fruit black.

Tafahi: in forest along road between township of Tafahi and landing place at Faihavanui, alt. 100 m., Dec. 15, 1951, *Hürlimann 562*.

Niuatoputapu: in forest, slope of ridge above Hihifo, alt. 60 m., Dec. 5, 1951, *Hürlimann 339*.

Known in Tonga from only the northernmost islands. Samoa.

Tongan name: *poumuli*.

[824] [342] [313] The timber is very hard and is used for various purposes, including house construction.

Family ANACARDIACEAE

Genus **Mangifera** Linnaeus

Mangifera indica Linnaeus, Sp. Pl., 200, 1753.

Large, dense, round-topped tree. Leaves alternate, simple, oblong-lanceolate, acute, coriaceous and somewhat shiny, pinnately nerved, midrib prominent, young leaves often reddish, petioles up to 5 cm. or more long. Flowers small, yellowish white, in large, terminal panicles; fruit a fleshy, edible drupe with a large, compressed, fibrous stone.

Tongatapu: roadside south of Ma'ofanga, Nov. 23, 1951, *Hürlimann 320*.

Introduced for its fruit and common about villages throughout Tonga, this tree grows spontaneously in thickets, along roadsides, and so forth. A tropical Asiatic species now cultivated in tropical regions throughout the world.

137 Tongan name: *mango*. The following varieties are recognized:

262 *Mango kaimata:* fruit is sweet and edible before it is fully ripened. Various forms of this variety are based on the size of the fruit.

Mango kalasini: fruit has an odor resembling kerosene.

Mango lesi: fruit is of medium size and of the best quality. Three or four forms of this variety are recognized.

Mango nui: fruit is very large.

Genus **Spondias** Linnaeus

137 **Spondias dulcis** Parkinson, Jour. Voy. Endeavour, 39, 1773.

Medium to large, stiff-branched tree, up to 15 m. or more tall. Leaves alternate, odd-pinnate, leaflets commonly 11 to 15, oval-lanceolate or oblong, acuminate, base acute, remotely finely toothed, up to 8 cm. or more long and 2.5 cm. wide. Flowers small, numerous, whitish, in large, paniculate clusters; the fruit yellow, oval-obovate, up to 7 cm. or more long, fleshy, edible.

Tongatapu: *Forster; U.S. Expl. Exped.:* in forest near Nualei, south of Nuku'alofa, Mar. 9, 1953, *Yuncker 15244;* near house, Ma'ofanga, Nov. 23, 1951, *Hürlimann 311.* 137

'Eua: *Lister;* in Ohonua village, Apr. 2, 1953, *Yuncker 15636.*

Of early introduction. Malaysia to Polynesia.

Tongan name: *vi.*

The timber[1] is used for general building purposes, and large trunks are used for dugout canoes. [824] [396] [313]

Genus **Pleiogynium** Engler

Pleiogynium solanderi (Bentham) Engler, in DC. Monogr. Phanerog. **4**:255, 1883.

Medium to large tree up to 10 m. or more tall. Leaves alternate, odd-pinnate, leaflets seven to nine, obliquely elliptic or elliptic-ovate, acuminate, base acute and narrowly decurrent on petiolules, up to 10 cm. or more long, pinnately nerved, petiolules mostly scarcely 1 cm. long. Flowers small, densely clustered on rather short, axillary clusters; fruit turbinate, about 2.5 cm. in diameter, broadly grooved.

'Eua: margin of forest near center of island, Mar. 18, 1953, *Yuncker 15332;* in seaward forest on terrace above Houma village, Mar. 26, 1953, *Yuncker 15507.*

Vava'u: *Crosby;* on seaward face of coastal cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16114.*

Occasional. From tropical Australia to Polynesia.

Tongan name: *tangato.*

An excellent timber tree. [824] [313]

Genus **Rhus** Linnaeus

Rhus taitensis Guillemin, Ann. Sci. Nat. Bot. II, **7**:361, 1837.

Medium to large forest tree with young parts more or less puberulent. Leaves large, alternate, odd-pinnate, leaflets up to 19 or more, oblong, bluntly pointed, base obliquely inequilateral, up to 10 cm. or more long, short-petiolulate. Flowers small, white, numerous, in large, terminal, compound clusters 30 cm. or more long.

Tongatapu: *U.S. Expl. Exped.;* open forest near Vaini village, Feb. 26, 1953, *Yuncker 15066;* forest, terrace below Fu'amotu, Nov. 3, 1951, *Hürlimann 139.*

'Eua: *Lister;* open forest near center of island, Mar. 19, 1953, *Yuncker 15365.*

Lifuka: clearing near center of island, infrequent, Apr. 27, 1953, *Yuncker 15773.*

Kao: lower margin of slope forest, May 6, 1953, *Yuncker 15972.*

Vava'u: *Crosby.*

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[1] /Spondias dulcis -- Analyst/

76: Yuncker N-4,5 (1953) 1959 OU9 Tonga OU9

137 Niuatoputapu: in forest, top of mountains above Hihifo, alt. 100 m., Dec. 5, 1951, *Hürlimann 346.*

Frequent throughout Tonga. Philippines to Polynesia.

Tongan name: *tavahi.*

[824] [313] [278] The timber[1] is used for general construction purposes, banana shooks, and so on; the leaves, in medicines.

FAMILY CELASTRACEAE

Genus **Gymnosporia** Wight and Arnott

Gymnosporia vitiensis (A. Gray) Seemann, Fl. Vit., 40, 1865.

Scrambling, much-branched shrub or small tree up to 4 m. tall, the twigs angled. Leaves alternate, oval, obtuse or subacute, base wedge-shaped, minutely toothed, up to 8 or 9 cm. long and 5 cm. wide, pinnately nerved, petioles up to 1 cm. long. Flowers white, about 5 mm. wide, five-parted, on slender pedicels in the axils of small, fimbriate-ciliate bracts, in terminal or axillary, paniculate clusters; fruit three-celled, red, seeds red.

Tongatapu: *Nelson.*

'Eua: *Lister;* sea-facing side of limestone cliff near summit of eastern ridge, Apr. 8, 1953, *Yuncker 15675;* forest near center of island, Apr. 6, 1953, *Yuncker 15651;* seaward terrace above village of Honuma, Mar. 26, 1953, *Yuncker 15502;* little valley on eastern ridge, plateau above Fuai, Nov. 9, 1951, *Hürlimann 189.*

Nomuka: along road encircling island between sea and inland lake, Apr. 30, 1953, *Yuncker 15834.*

Vava'u: *Crosby;* seaward face of limestone coastal cliff above Leimatua, May 20, 1953, *Yuncker 16056;* upper rim of steep seaside cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16086;* sprawling on side of rocky cliff near sea below Houma village, May 22, 1953, *Yuncker 16132.*

Common and widely distributed throughout Tonga. Fiji and eastward in Polynesia to Samoa, Society Islands, and the Marquesas.

Tongan name: *olamaka.*

[824] [352] The long, pliable branches are used in making chairs.

FAMILY ICACINACEAE

Genus **Citronella** D. Don

Citronella samoensis (A. Gray) Howard, Jour. Arnold Arboretum 21: 475, 1940.

Tree with diffuse top, up to 6 m. or more tall. Leaves leathery, glossy, oval-ovate, acuminate, base acute, entire, up to 15 cm. or more long and 8 cm. wide, pinnately nerved, lateral nerves submarginally loop-connected, petioles 1-2 cm. long, canaliculate. Flowers small, in few-flowered clusters in a terminal racemose cluster up to 15 cm. long; fruit ellipsoidal, about 2-3 cm. long, black.

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[1] /Rhus taitensis -- Analyst/

76: Yuncker N-4,5 (1953) 1959 OU9 Tonga OU9

137 Tongatapu: *Forster;* forest near village of Niutoua, Mar. 2, 1953, *Yuncker 15168.*

'Eua: open forest along trail between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15486.*

Vava'u: *Crosby.*

Niuatoputapu: near township of Vaipoa, on road to Falehau, alt. 5 m., Dec. 7, 1951, *Hürlimann 377.*

Occasional throughout Tonga. Malaya, New Guinea, and Polynesia.

Tongan name: *tava.*

Varieties are recognized under the following names: *tava kula, tava moli, tava toua.*

[924] [313] [342] [262] [278] The timber[1] is used in house construction, for tapa pounders, for banana shooks, and so on; the fruit is sometimes eaten; and the bark is used in medicine for "stomach troubles."

Genus Guioa Cavanilles

Guioa lentiscifolia Cavanilles, Icones Descr. Pl. 4: 50, pl. 373, 1797.

Small tree 3-5.5 m. tall, young twigs, leaves, and so forth puberulent. Leaves alternate, pinnately compound, leaflets varying in number, apex rounded, obtuse to acute, base narrowed and decurrent on very short petiolule, up to 6 cm. long and 3 cm. wide but mostly smaller, pinnately nerved, midrib prominent, lateral nerves slender, submarginally loop-connected. Flowers small, white, in terminal and axillary, paniculate clusters; fruit strongly lobed, up to 2 cm. wide.

'Eua: seaward margin of forest on terrace above village of Houma on northwestern side of island, alt. about 160 m., Mar. 26, 1953, *Yuncker 15503;* thicket, edge of forest above Fuai plantation, near center of island, Mar. 29, 1953, *Yuncker 15545.*

Vava'u: near upper rim of seaside cliff above Ha'alaufuli on northeastern side of island, alt. about 120 m., May 21, 1953, *Yuncker 16106.*

Tongan name: *'olive.*

[113] The cited specimens certainly appear to represent the endemic described and illustrated by Cavanilles and further briefly discussed by Radlkofer (Sitzber. Math.-Phys. Kl. Akad. Wiss. München 9: 608, 1879; Pflanzenr. 98 [IV. 165]: 1158, 1933). It may be noted that Radlkofer defines *Guioa* as having squamate petals, but Cavanilles gives no indication of this character in his description or plate, and the material now dissected (*Yuncker 15503*) shows the petals to be esquamate. As *G. lentiscifolia* is the genotype, a revision of Radlkofer's circumscription is a matter for the future monographer to consider. Actually, on the basis of other characters, the many species now referred to *Guioa* seem correctly placed, but less dependence upon petal characters may [113] be indicated. Possibly this is the species listed by Hemsley (Linn. Soc. Bot. Jour. 30: 172, 1894) and Burkill (op. cit. 35: 33, 1901) as *Guioa glauca*

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[1] /Pometia pinnata -- Analyst/

(Labillardière) Radlkofer; but that species is apparently limited to New Caledonia, in spite of Radlkofer's inclusion in its synonymy of the mysterious Tongan "*Guaiacum dubium* Forst. f." 137

Guaiacum dubium Forst. f. (Fl. Ins. Australia, Prodr., 32, 1786) was originally described as "Foliis coniugatis oblongolanceolatis obtusis." Fortunately a photograph of Forster's specimen in the British Museum (Natural History) is available, through the kindness of Dr. C. Taylor, and it indicates that the very poor specimen is a mixture. The detached fruits seem to represent a species of *Guioa*, very likely *G. lentiscifolia*, whereas the leaves (mostly detached) apparently do not represent Sapindaceae. For the time being, no alternative suggestion can be made. The name may thus be rejected under Article 76 of the International Code (1952). Certainly the epithet should not be used to replace either *G. lentiscifolia* or *G. glauca* (A. C. Smith). [113]

Genus **Elattostachys** Radlkofer

Elattostachys falcata (Seemann) Radlkofer, Sapindaceen Höll.-Ind., 42, 1877.

Large forest tree. Leaves alternate, pinnate, leaflets 10 or more, falcately lanceolate, acuminate, base obliquely inequilateral, entire, up to 15 cm. long and 5 cm. wide, somewhat coriaceous, petiolules up to about 1 cm. long. Flowers white, small, in terminal or axillary, paniculate clusters.

Tongatapu: *Moseley*; open forest, roadside below village of Niutoua, Mar. 2, 1953, *Yuncker 15120*; in coastal forest near Ha'akame village, Mar. 12, 1953, *Yuncker 15270, 15277*.

'Eua: in forest above Fuai plantation, near center of island, Mar. 18, 1953, *Yuncker 15315*.

Kao: open forest on steep, rocky slope, May 6, 1953, *Yuncker 15898*.

Vava'u: *Crosby*; near upper rim of steep seaside cliff, above Ha'alaufuli, May 21, 1953, *Yuncker 16100*.

Niuafo'ou: forest, slope above great lake, toward Futu, alt. 20 m., Jan. 7, 1952, *Hürlimann 669*.

Tafahi: forest, below township of Tafahi toward Hou, alt. 20 m., Dec. 17, 1951, *Hürlimann 583*.

Frequent throughout Tonga in forested areas. Also in Fiji, Niue, and Samoa.

Ratonia falcata Seem., and probably also as *R. stipitata* Benth., in Hemsley's list.

Tongan name: *ngatata*.

The tree furnishes a good timber for general construction purposes, for banana shooks, for handicraft work, and other objects. [824] [313]

Introduced ornamental.[1] Frequent about dwellings and cemeteries. Occasional as an escape in waste areas. An African species now of worldwide cultivation. 137 [824] [247] [351]

Tongan name: *polosomo.*

FAMILY RHAMNACEAE

Genus **Rhamnella** Miquel

Rhamnella vitiensis (Bentham) A. C. Smith, Torrey Bot. Club, Bull. **70**: 544, 1943.

"A small, gnarled tree, up to 3 m. or more tall. Leaves oval. Flowers axillary, the petals pale yellow."

Vava'u: *Crosby.*

Infrequent. From Queensland and New Guinea eastward to Tonga.

Rhamnus vitiensis Benth. in Burkill's list.

Tongan name: *taka.*

Genus **Colubrina** L. C. Richard

Colubrina asiatica (Linnaeus) Brongniart, Ann. Sci. Nat. 10: 369, 1827.

More or less sprawling shrub, or sometimes a small tree up to 3 or 4 m. tall. Leaves simple, alternate, ovate, acuminate, base rounded or subcordate, crenate-dentate, up to 8 cm. or more long and 5 cm. wide, palmately three-nerved, midrib branched upward, nearly glabrous, petioles about 1 cm. long. Flowers small, yellowish green, on slender pedicels, in small, axillary, short-pedunculate, cymose clusters; fruit subglobose, 6-8 mm. in diameter, greenish.

Tongatapu: in seaside thicket along road west of Nuku'alofa, Mar. 7, 1953, *Yuncker 15214;* near Navutoka village, Feb. 27, 1953, *Yuncker 15094;* near beach eastward of Ma'ofanga, Oct. 29, 1951, *Hürlimann 19.*

'Eua: *Lister;* near sea, above Ohonua village, Apr. 2, 1953, *Yuncker 15619.*

Nomuka: margin of thicket on lakeward side of road encircling island, May 30, 1953, *Yuncker 15836.*

Lifuka: seaside thicket toward northern end of island, Apr. 24, 1953, *Yuncker 15703.*

Vava'u: *Crosby;* upper rim of seaside cliff northeast of Leimatua, May 20, 1953, *Yuncker 16059.*

Niuatoputapu: plain south of Falehau, Dec. 7, 1951, *Hürlimann 382.*

Frequent near the shore throughout Tonga. From Africa and India eastward to Polynesia.

Tongan name: *fiho'a.*

The bark and the leaves lather when rubbed in water and may be used as a soap substitute. [824] [515]

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[1] /Impatiens balsamina -- Analyst/

Genus **Alphitonia** Reissek

137 **Alphitonia zizyphoides** (Solander) A. Gray, U.S. Expl. Exped., Bot. 1:278, pl. 22, 1854.

Medium to large tree with young branches brown-tomentose. Leaves alternate, elliptic-lanceolate, acute, base rounded, obtuse or acutish, up to 15 cm. or more long and 5 cm. wide, pinnately nerved, nerves prominent, bright green above, whitened-tomentose beneath, petioles 1-2 cm. long. Flowers small, whitish, numerous, in branching, axillary, and terminal, cymose clusters; fruit about 5 mm. in diameter, purplish.

Tongatapu: *U.S. Expl. Exped.; Home;* forest near sea, vicinity of Niutoua village, Mar. 2, 1953, *Yuncker 15121.*

'Eua: *Lister;* summit of eastern ridge above Fuai, Nov. 9, 1951, *Hürlimann 199;* open forest near center of island, Mar. 19, 1953, *Yuncker 15360.*

Nomuka: clearing along road encircling island between sea and central lake, Apr. 30, 1953, *Yuncker 15819.*

Lifuka: roadside, between Pangai village and southern end of island, Apr. 28, 1953, *Yuncker 15784.*

Kao: lower margin of slope forest, May 6, 1953, *Yuncker 15962.*

Vava'u: *Crosby;* upper slope of Talau, west of Neiafu, May 24, 1953, *Yuncker 16153.*

Tafahi: along road from township of Tafahi toward Taihavanui, Dec. 15, 1951, *Hürlimann 567.*

Frequent throughout Tonga. From Sumatra and the Philippines eastward to Polynesia.

A. excelsa Reiss. in Hemsley's and Burkill's lists.

Tongan name: *toi.*

824 313 396 278 515

This tree provides an excellent grade of timber useful in construction work and for dugout canoes, poi pounders, banana shooks, and the like. The bark is used in preparing medicines, and the leaves may be used as a soap substitute.

FAMILY ELAEOCARPACEAE

Genus **Elaeocarpus** Linnaeus

Elaeocarpus tonganus Burkill, Linn. Soc. Bot., Jour. 35:29, 1901.

Medium-sized tree up to 10 m. or more tall. Leaves alternate, elliptic or elliptic-ovate, acuminate, base acutish or obtuse, crenulate, up to 12 cm. or more long and 6 cm. wide, pinnately nerved, petiole slender, up to 4 or 5 cm. long. Flowers less than 1 cm. long, in simple, mostly axillary racemes up to 5 cm. or more long, pedicels up to 1.5 cm. long, inflorescence silky-hairy; fruit ellipsoidal, up to 1.5 cm. long.

'Eua: in forest near summit of eastern ridge, Mar. 30, 1953, *Yuncker 15554* [a juvenile specimen, presumably this species].

Vava'u: *Crosby 15* [type]; edge of forest above Leimatua, May 20, 1953, *Yuncker 16055;* on steep slope leading to lagoon at Vaihoi, below Leimatua, May 26, 1953, *Yuncker 16183.*

137 *G. mallococca* L. f. in Hemsley's and Burkill's lists.

Tongan name: *fo'ui.*

824 The timber[1] is used for banana shooks and the bark fibers for cordage.

313 283 **Grewia prunifolia** A. Gray, U.S. Expl. Exped., Bot. 1: 199, 1854.

Shrub. Leaves alternate, ovate or lanceolate, acuminate, base rounded, 5-8 cm. long, finely serrulate, three-nerved from base, midrib pinnate above, glabrous, petioles scarcely 1 cm. long. Flowers one to three on short, axillary peduncles, less than 1 cm. wide; fruit four-lobed, somewhat hirsute.

Tongatapu: *Moseley.* Also in Fiji.

Genus **Triumfetta** Linnaeus

Triumfetta bartramia Linnaeus, Syst., ed. 10, 1044, 1759.

Densely stellate-hairy, half-woody, branching, shrublike plant up to 2 m. or more tall. Leaves alternate, round-ovate, mostly three-lobed, lobes acuminate, serrate, base rounded, cordulate, up to 8 cm. or more long and 7 cm. wide, palmately five- to seven-nerved, petiole slender, up to 6 cm. or more long. Flowers small, yellow, in compact, axillary fascicles; fruit subglobose, about 5 mm. in diameter, covered with hooked bristles.

Tongatapu: waste area near Blow Hole area below Houma village, June 1, 1953, *Yuncker 16218.*

Lifuka: old plantation near southern end of island, Apr. 28, 1953, *Yuncker 15786.*

Vava'u: *Crosby.*

Tafahi: plantation above township of Tafahi, alt. 70 m., Dec. 15, 1951, *Hürlimann 526.*

Frequent as a plantation and waste-area weed throughout Tonga. Pantropic.

T. rhomboidea Jacq. in Burkill's list.

Tongan names: *mo'osipo, mo'osipo enge'enga.*

Triumfetta procumbens Forster f., Fl. Ins. Australia, Prodr., 35, 1786.

Prostrate, semi-woody plant with long, trailing, densely stellate-pubescent branches. Leaves simple, alternate, round-ovate in outline, rounded-cordate at base, commonly three-lobed, lobes obtuse, crenate-serrate, up to 6 cm. or more long and as wide, palmately five- to seven-nerved, petioles as long as or exceeding blade. Flowers about 1 cm. long, yellow, in axillary, pedunculate, umbellate clusters, fruit globose, about 12 mm. in diameter, covered with pubescent bristles.

Tongatapu: *Mathews; Home; Graefe;* in sand near sea below village of Fu'amotu, Mar. 4, 1953, *Yuncker 15165;* on sand at upper edge of beach below steep cliff near Haveluliku village, June 3, 1953, *Yuncker 16234.*

'Eua: pioneering in sand, margin of seaside thicket just above high-tide limit, Ha'aluma, Apr. 1, 1953, *Yuncker 15601.*

Vava'u: *Crosby.*

Tafahi: on shore below township of Tafahi, Dec. 13, 1951, *Hürlimann 492.*

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[1] /Grewia crenata -- Analyst/

76: Yuncker N-4,5 (1953) 1959 OU9 Tonga OU9

irregularly toothed, up to 8 cm. or more long and as wide, stellate-pubescent, petioles up to 5 cm. or more long. Flowers on short axillary pedicels, corolla white to pink; fruit about 1 cm. wide, the five segments covered with barbed spines, burlike. 137

Tongatapu: *U.S. Expl. Exped.;* along forest trail near Niutoua village, Mar. 2, 1953, *Yuncker 15136.*

'Eua: in clearing near center of island, Mar. 24, 1953, *Yuncker 15434.*

Vava'u: *Harvey; Crosby.*

Frequent as a roadside and waste-area weed. An Indo-Malaysian species now pantropic.

Hemsley lists *U. morifolia* DC. for Tonga on the authority of de Candolle and cites no collections. This is now considered to be a synonym of *U. sinuata* Linnaeus which is now treated as a synonym of *U. lobata.*

Tongan name: *mo'osipo.*

The leaves[1] are used in medicines. [824] [278]

Genus Hibiscus Linnaeus

Hibiscus abelmoschus Linnaeus, Sp. Pl., 693, 1753.

Hirsute, subwoody plant, up to about 1 m. tall. Leaves alternate, broadly ovate in outline, up to 12 cm. long and about as wide, base cordate, palmately three- to five-lobed, lobes acute to acuminate, toothed, petioles about as long as the blade. Flowers 5 cm. or more wide, solitary, on axillary pedicels up to 5 cm. or more long, corolla yellow with an orange or red center; capsule oblong, pointed, 5 cm. or more long, hirsute, splitting into five sections.

'Eua: *Lister;* scattered plants in undergrowth of old coconut plantation near Ha'aluma, Apr. 1, 1953, *Yuncker 15585.*

Vava'u: *Barclay; Crosby;* in wet, marshy edge of Ngofe swamp, on southwestern side of island. May 20, 1953, *Yuncker 16030.*

Occasional in waste areas. India to Malaya and Polynesia.

Tongan names: *loa, fau'ingo.*

The seeds furnish a dye used in decorating tapas, and various parts of the plant are used in preparing medicines. [824] [386] [278]

Hibiscus rosa-sinensis Linnaeus, Sp. Pl., 694, 1753.

Shrub up to 3 m. or more tall. Leaves simple, alternate, ovate, acute, base obtuse or subacute, up to 15 cm. or more long and 12 cm. wide, dentate, palmately five-nerved, petiole up to about 5 cm. long. Flowers up to 12 or 15 cm. wide, on slender, elongate axillary pedicels near ends of branches, various shades of red.

Cultivated about villages as an ornamental. Occasionally adventive. An Asiatic species now cultivated in warm countries throughout the world. [245] [824]

Hibiscus schizopetalus (Masters) Hooker f., Curtis's Bot. Mag. III, 36: pl. 6524, 1880.

Glabrous shrub up to about 3 m. or more tall. Leaves alternate, ovate-elliptical, acute, dentate. Flowers solitary, pendulous on long pedicels at ends of slender, drooping branches, petals much dissected, reflexed, coral red.

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[1] /Urena lobata -- Analyst/

137 245 824 Occasionally[1] in villages as an ornamental. A native of tropical Africa now widely cultivated in warm countries.

Hibiscus syriacus Linnaeus, Sp. Pl., 695, 1753.

Erect, branching, glabrous shrub 2 m. or more tall. Leaves rhombic-ovate, alternate, lower ones often three-lobed, toothed, acute to acuminate. Flowers up to 8 cm. wide, red or purplish, solitary in leaf axils on current season's growth; fruit ovoid, up to 2.5 cm. long.

Introduced ornamental. Occasional. A Chinese species now of worldwide cultivation in tropical and temperate countries.

Hibiscus tiliaceus Linnaeus, Sp. Pl., 694, 1753.

Tree up to 8 m. or more tall with glabrous or somewhat pubescent, spreading branches. Leaves round-ovate, abruptly acuminate, base deeply cordate with a narrow sinus, up to 15 cm. or more long and nearly as wide, palmately seven- to nine-nerved, glabrescent above, paler and densely stellate-pubescent beneath, petioles up to 12 or 15 cm. long. Flowers up to 10 cm. wide, on short, axillary and terminal pedicels, corolla yellow with darker eye, turning salmon red; capsule pubescent, five-celled, several-seeded, seeds glabrous.

Tongatapu: thicket near beach, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15027*.

'Eua: *Lister;* in thin forest below Fuai plantation, near center of island, Mar. 19, 1953, *Yuncker 15358*.

Lifuka: in seaside thicket just above high-tide limit, north of Pangai village, Apr. 25, 1953, *Yuncker 15742*.

Vava'u: *Harvey; Crosby*.

Tafahi: coastal forest, below township of Tafahi, Dec. 13, 1951, *Hürlimann 490*.

Frequent throughout Tonga, usually near the shore. Pantropic.

Tongan name: *fau*.

824 283 313 278 757 The bark fibers are used in making cordage, mats, *tauvale*, kava filters, and so forth. The wood is used in general construction work and fences: the bark and young leaves, in the treatment of skin diseases.

Genus **Thespesia** Solander

Thespesia populnea (Linnaeus) Solander, ex Correa, Mus. Nat. Hist. Nat. Paris, Ann. 9:290, 1807.

Medium-sized, round-topped tree, the young branches brown-scurfy. Leaves simple, alternate, somewhat fleshy, ovate, acuminate, base cordate with an open sinus, entire or rarely somewhat lobed, palmately five- to seven-nerved, up to 12 cm. or more long and 10 cm. wide, petioles up to 10 cm. or more long. Flowers up to 8 or 10 cm. wide, solitary, on stout, axillary pedicels, corolla yellow with reddish center, changing to purple with age; capsules depressed-globose, about 2.5 cm. in diameter, seeds 10, hairy.

Tongatapu: seaside thicket near Niutoua village, Feb. 27, 1953, *Yuncker 15107*.

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[1] /Hibiscus schizopetalus -- Analyst/

'Eua: *Lister;* deep ravine northeast of Ohonua village, Apr. 2, 1953, *Yuncker 15629.* 137

Lifuka: near sea north of Pangai village, Apr. 25, 1953, *Yuncker 15746.*

Vava'u: *Crosby.*

Tafahi: coastal forest, near Hou, alt. 5 m., Dec. 17, 1951, *Hürlimann 586.*

Frequent near the shore throughout Tonga. Pantropic.

Tongan name: *milo.*

The leaves and fruit[1] are used in preparing medicines. The timber takes a good polish, is durable under water, and is used in construction and handicraft work. [824] [278] [313]

Genus **Gossypium** Linnaeus

Gossypium brasiliense Macfayden, Fl. Jamaica 1:72, 1837.

Semi-shrubby, branching plant, up to 1.5 m. or more tall. Leaves alternate, round-ovate in outline, three- to five-lobed, lobes entire, on long petioles. Involucral bracts cordate, laciniate, acuminate, seeds numerous, covered with long, white fibers.

Vava'u: *Crosby.*

Introduced and occasional in villages. Pantropic.

Tongan name: *vavae.*

Hibiscus manihot Linnaeus, called *pele* by the Tongans, is cultivated for its young growth, which is used as a green vegetable. [824] [244] [262]

FAMILY BOMBACACEAE

Genus **Ceiba** Medikus

Ceiba pentandra (Linnaeus) Gaertner, Fruct. et Semin. Pl. 2:244, pl. 133, fig. 1, 1791.

Medium to large, glabrous, soft-wooded tree with smooth or short-spiny bark and whorled, spreading branches. Leaves palmately compound, leaflets five to nine, elliptic to oblanceolate, entire, of various sizes, acuminate, petioles long. Flowers white or pinkish, petals pubescent, up to 2.5 cm. long; capsules up to 15 cm. long, seeds numerous, silky-hairy.

Introduced and now occasional in villages and along roadsides throughout the group.

The silky seed fibers are used as a filling for pillows and cushions. Probably of tropical American origin; now pantropic. [824]

Tongan name: *vavae.*

FAMILY STERCULIACEAE

Genus **Melochia** Linnaeus

Melochia aristata A. Gray, U.S. Expl. Exped., Bot. 1:193, 1854.

Small tree, up to 4 m. or more tall. Leaves alternate, ovate, acute, base rounded, obtuse or abruptly acute, up to 12 cm. or more long and 8 cm. wide, palmately five- to seven-nerved, midrib branched upward, crenately toothed, petiole slender, up to 8 cm. or more

[1] /Thespesia populnea -- Analyst/

76: Yuncker N-4,5 (1953) 1959 OU9 Tonga OU9

137 long. Flowers about 1 cm. wide, in compound, many-flowered, axillary cymes, corolla white in center, shading to rose outward; capsule ovoid, deeply five-lobed, carpels opening apically. All parts of the plant stellate-pubescent.

Tongatapu: *Forster.*

Vava'u: *Barclay; Harvey; Crosby;* in thicket near Ngofe swamp, May 19, 1953, *Yuncker 16029.*

Niuatoputapu: scrubby forest, mountain ridge above Vaipoa, alt. 100 m., Dec. 14, 1951, *Hürlimann 362;* coastal forest between Hihifo and Vaipoa, Dec. 14, 1951, *R. Hingano (Hürlimann 627).*

Infrequent. Also in Samoa.

M. odorata L. f. in Hemsley's and Burkill's lists.

Tongan names: *fukofuka, mako.*

824
226
313
The wood[1] is light and is used for making floats for fish nets and also for firewood.

Genus Waltheria Linnaeus

Waltheria americana Linnaeus, Sp. Pl., 673, 1753.

Densely hairy, small, shrubby plant. Leaves alternate, oval-ovate, blunt or acutish, base rounded, cordulate, downy-pubescent, serrate, up to 8 cm. long, nerves prominent. Flowers small, in dense, axillary clusters, corolla yellow; capsules small, two-valved.

Vava'u: *Crosby.*

Infrequent. A tropical American weedy plant now of wide distribution in tropical countries.

Genus Kleinhovia Linnaeus

Kleinhovia hospita Linnaeus, Sp. Pl., ed. 2, 1365, 1763.

Tree, up to about 15 m. tall, young branches pubescent. Leaves alternate, broadly ovate, acuminate, base truncate or cordate, up to 15-20 cm. long and 15 cm. wide, entire, essentially glabrous, palmately five- to seven-nerved, midrib branched upward, petioles up to 8-10 cm. or more long. Flowers about 1 cm. long, in terminal or axillary panicles up to 30 or 40 cm. long, pedicels jointed at about middle, narrow sepals longer than pink or rose-colored petals, pubescent; capsules about 2 cm. long, membranous, inflated, obovate, five-parted, seeds usually one in each carpel, globose.

Vava'u: *Crosby;* edge of clearing along road about 3 miles northwest of Neiafu, May 20, 1953, *Yuncker 16083.*

Infrequent. From tropical Africa and India through Malaya to Polynesia.

Tongan name: *fukofuka.*

824
313
The wood is used for building purposes.

Genus Sterculia Linnaeus

Sterculia fanaiho Setchell, Carnegie Inst. Washington, Pub. 20: 69, fig. 13A, 1924.

Tree up to 8 m. or more tall. Leaves alternate, broadly elliptic-ovate, abruptly short-acuminate, base rounded, cordate, entire, up to 20 cm. or more long and 12 cm. wide, pal-

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[1] /Melochia aristata -- Analyst/

137
824
342
313
415
278

Tongan names: *feta'u, tamanu.*

This strong and durable wood[1] is used in house construction and other building purposes, and sections of the trunk are used to make large kava bowls. The oil from the seeds is used medicinally.

Calophyllum vitiense Turrill, Linn. Soc. Bot., Jour. **43**: 17, 1915.

Tree, up to 10 m. or more tall, stems to 35 cm. in diameter. Leaves opposite, oblong-elliptic, obtuse or acute, base acute-decurrent, up to 13 cm. or more long and 5 cm. wide, leathery, glossy, entire, pinnately nerved, midrib prominent, lateral nerves very slender, numerous, parallel, petiole 1-2 cm. long, canaliculate. Flowers about 1.5 cm. wide, in racemose, axillary clusters, corolla pink, stamens numerous; fruit subglobose, 2 cm. or more in diameter, outer flesh pink when young.

'Eua: margin of forest near summit of eastern ridge, Mar. 24, 1953, *Yuncker 15435;* forest near center of island, Mar. 18, 1953, *Yuncker 15326.*

Kao: in forest on steep, rocky slope, May 6, 1953, *Yuncker 15883.*

Occasional. Also in Fiji and the Solomon Islands.

No differences of consequence are apparent among these specimens and the numerous Fijian collections referred to *C. vitiense,* except that the latter have white flowers. This species, not otherwise recorded from Tonga, is probably the one listed by Hemsley (Linn. Soc. Bot., Jour. **30**: 169, 1894) as *C. spectabile* and by Burkill (op. cit. **35**: *27,* 1901) as *Calophyllum* sp. (A. C. Smith).

Tongan name: *tamanu.*

824
313

The timber is strong and hard and is used for building purposes.

Genus **Garcinia** Linnaeus

Garcinia myrtifolia A. C. Smith, Jour. Arnold Arboretum **31**: 315, 1950.

Glabrous tree, up to 7 m. or more tall, the trunk up to 25 cm. in diameter. Leaves elliptic or subovate, up to 14 cm. long and 7 cm. wide, obtuse or short-acute, base rounded, abruptly acute-decurrent, subcoriaceous, pinnately nerved, midrib prominent, lateral nerves numerous, very slender, petiole stout, canaliculate, about 1 cm. long. Flowers mostly solitary, on axillary pedicels about 1 cm. long; fruit ellipsoidal, about 2 cm. in diameter, with an apical crownlike thickening.

'Eua: edge of forest near center of island, Mar. 20, 1953, *Yuncker 15381.*

Kao: in forest on steep, rocky slope, May 6, 1953, *Yuncker 15908, 15955.*

Occasional.

These interesting specimens are clearly referable to the supposed Fijian endemic, of which at least three other Fijian collections have been noted since its description (A. C. Smith).

Tongan name: *feto'omaka.*

824
303

The bark is used for scenting oil.

Garcinia pseudoguttifera Seemann, Fl. Vit., 40, 1865.

Tree, up to 6 m. or more tall. Leaves opposite, obovate, apex rounded, emarginate, base acute-decurrent, up to 7 cm. or more long and 5 cm. wide, coriaceous, pinnately

[1] /Calophyllum inophyllum -- Analyst/

nerved, midrib prominent, lateral nerves very fine, numerous, petiole up to about 2 cm. long. Flowers about 1 cm. wide, in few-flowered, axillary, cymose clusters, petals red, stamens numerous.

Vava'u: near village of Mataika, north of Neiafu, May 27, 1953, *Yuncker 16204*. Believed to be a new record for Tonga. Frequent in Fiji.

Tongan name: *mo'onia.*

Garcinia sessilis (Forster) Seemann, Viti, 433, 1862.

Tree, up to 8 m. tall. Leaves opposite, elliptical, acute at both ends, entire, up to 11 cm. or more long and 6 cm. wide, pinnately nerved, lateral nerves very slender, petiole up to about 1 cm. long. Flowers coral or salmon red, sessile, axillary, about 1 cm. wide, four-parted, fragrant.

Tongatapu: *Nelson;* in open forest below Lavengatonga village, Mar. 6, 1953, *Yuncker 15177*.

'Eua: *Lister;* in second-growth forest, near Pangai village, Mar. 25, 1953, *Yuncker 15464*.

Nomuka: open area along road encircling island, Apr. 30, 1953, *Yuncker 15864*.

Vava'u: near Houma village, May 22, 1953, *Yuncker 16118*.

Occasional throughout Tonga. Also in Fiji and Samoa.

Tongan name: *heilala.*

The flowers are used in leis: the leaves, for medicines.

[824]
[301]
[278]

FAMILY VIOLACEAE

Genus **Melicytus** Forster

Melicytus ramiflorus J. R. and G. Forster, Char. Gen. Pl., 124, 1776.

Shrub or small tree up to 5 m. tall and 15 cm. in diameter. Leaves alternate, elliptic or elliptic-subobovate, acute at both ends, minutely crenate, up to 15 cm. or more long and 7 cm. wide, pinnately nerved, finely venulose-areolate by transmitted light, petiole about 1 cm. long. Flowers greenish white, 3-6 mm. wide, on slender pedicels somewhat longer than flowers, in few-flowered, umbellate clusters.

'Eua: *Lister;* dark, moist forest of ravine north of Fuai plantation, near center of island, Mar. 19, 1953, *Yuncker 15349*. In Tonga, known only from 'Eua. Also grows in New Zealand and on Norfolk Island.

Tongan name: *pualiki.*

Genus **Agatea** A. Gray

Agatea violaris A. Gray, U.S. Expl. Exped., Bot. 1: 89, pl. 7, 1854.

Shrublike, climbing woody plant. Leaves alternate, elliptic or elliptic-subobovate, acuminate, base rounded, obtuse, up to 10 cm. or more long and 5 cm. wide, entire, red-glandular dotted by transmitted light, petioles slender, up to about 2 cm. long. Flowers numerous, in paniculate or racemose, terminal or axillary clusters, petals ciliate.

'Eua: in deep forested ravine north of Fuai plantation, near center of

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'Eua: *Lister;* in forest near center of island, Mar. 19, 1953, *Yuncker 15351;* edge of forest, Fuai, near center of island, Mar. 19, 1953, *Yuncker 15362;* margin of forest near summit of eastern ridge, Mar. 24, 1953, *Yuncker 15436;* near shore near Ha'aluma, Apr. 1, 1953, *Yuncker 15589.* 137

Vava'u: *Crosby;* margin of forest above Feletoa village, May 19, 1953, *Yuncker 16021;* top of seaside cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16087;* on seaward face of the limestone coastal cliff below Ha'alaufuli, May 21, 1953, *Yuncker 16095, 16102;* upper rim of seaside limestone cliff on the northwestern side of the island, May 25, 1953, *Yuncker 16177.*

Frequent throughout Tonga. Also in Fiji and southeastern Polynesia.

Tongan names: *filimoto, olamaka, kakala'uli.*

The timber^1 is used in some house construction.

824
313
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Genus **Flacourtia** L'Héritier

Flacourtia rukam Zollinger et Morren, Syst. Verz., 33, 1854.

Small or medium-sized tree up to 8 m. or more tall. Leaves simple, alternate, up to 15 cm. long and 8 cm. wide, elliptic-ovate, crenate, attenuately acuminate, base acute, on petioles scarcely 1 cm. long. Flowers small, greenish; fruit green, about 1 cm. long.

Niuatoputapu: secondary forest, base of range above Hihifo, alt. 40 m., Dec. 5, 1951, *Hürlimann 336.*

Infrequent. Dutch East Indies, Carolines, Niue, Samoa.

Genus **Homalium** Jacquin

Homalium vitiense Bentham, Linn. Soc. Bot., Jour. 4: 36, 1860.

Hemsley (Linn. Soc. Bot., Jour. **30**: 178, 1895) lists a collection of this species made by Lister on 'Eua. It has been assumed that this species is a Fijian endemic. The species of the genus are difficult to separate and, not having the Lister collection for study, I have not been able to verify its identity.

FAMILY PASSIFLORACEAE

Genus **Passiflora** Linnaeus

Passiflora edulis Sims, Curtis's Bot. Mag. **45**: pl. 1989, 1818.

Glabrous, tendril-bearing vine. Leaves alternate, broadly ovate in outline, deeply palmately three-lobed, lobes serrate, sharply acute, sinus rounded, petioles mostly about 2 cm. long, with pair of conspicuous glands near base of blade. Flowers axillary, about 5 cm. wide, purplish white; fruit globose, about the size of a small egg, rind hard, pulp edible.

'Eua: trailing on ground in open area in Mua village, Apr. 7, 1953, *Yuncker 15666.*

A tropical American species widely disseminated in warm countries as an ornamental. It sometimes escapes and becomes established.

Tongan name: *vaine tonga.*

^1 /Xylosma orbiculatum -- Analyst/

137 polygamous-dioecious, white or cream-colored, fragrant, female flowers sessile, axillary, male flowers smaller, in loose, paniculate clusters, on long, axillary peduncles; fruit green to yellow, of various shapes, up to 20 cm. or more long, flesh red orange, central cavity lined with small, round, black seeds.

[245] [824] Commonly cultivated 1 in villages and plantations throughout the group and frequent as an escape. A tropical American plant now cultivated as a food plant in most warm countries.

Tongan name: *lesi*. The following varieties are distinguished:

[262] *Lesi 'initia:* there are two forms of this variety, one with long fruit, the other with short, oval fruit.

Lesi meleni: the flesh is pink and not as sweet as the other varieties.

Lesi tonga: there are two forms of this variety, one with long fruit, the other with short, oval fruit.

FAMILY LYTHRACEAE

Genus **Pemphis** Forster

Pemphis acidula J. R. and G. Forster, Char. Gen. Pl., 68, pl. 34, 1776.

Low, sprawling, silky-pubescent shrub. Leaves opposite, lanceolate or elliptic-spatulate, acutish, up to about 2.5 cm. long and 6 mm. wide, entire, subsessile, crowded. Flowers solitary, axillary, about 15 mm. wide, petals white, membranous; fruit turbinate, about 6 mm. long.

Tongatapu: on coral rocks near shore, near Niutoua village, Mar. 2, 1953, *Yuncker 15132.*

'Eua: *Lister;* on coral rocks along strand at Lokupo, Mar. 27, 1953, *Yuncker 15524.*

Lifuka: scrambling over rocks along shore, Apr. 27, 1953, *Yuncker 15766.*

Vava'u: *Crosby; Harvey.*

Niuatoputapu: toward southeast coast near Falehau, Dec. 7, 1951, *Hürlimann 386.*

Frequent on rocks and cliffs along the shore throughout Tonga. From eastern Africa and tropical Asia eastward to Polynesia.

Tongan name: *ngingie.*

Genus **Lagerstroemia** Linnaeus

Lagerstroemia indica Linnaeus, Syst., ed. 10, 1076, 1759.

Shrub up to 3 m. or more tall, twigs somewhat quadrangular. Leaves alternate, elliptic or elliptic-subobovate, obtuse or acute, up to about 5 cm. long, subsessile. Flowers about 3 cm. wide, petals suborbicular, clawed, pink to lavender, in terminal or axillary paniculate clusters.

[245] [824] Introduced ornamental which is occasional in villages. A Chinese species now widely cultivated in warm countries.

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1 /Carica papaya -- Analyst/

FAMILY THYMELAEACEAE

Genus **Phaleria** Jack

Phaleria acuminata (A. Gray) Gilg. in Engler and Prantl, Nat. Pflanzenfam. 3(6a): 225, 1894.

Small tree, up to 3 m. or more tall, entirely glabrous. Leaves elliptic-ovate, acuminate, base rounded, obtuse, up to 15 cm. or more long and 6 cm. wide, somewhat papery, pinnately nerved, lateral nerves slender and submarginally loop-connected, petiole scarcely 1 cm. long, canaliculate. Flowers in terminal clusters, tubular, up to 3 cm. long, white; the fruit ovoid, about 1 cm. long.

Tongatapu: *Forster; Nelson.*

'Eua: *Lister.*

Vava'u: near upper rim of seaside cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16109.*

Occasional. Also in Fiji and Samoa.

Leucosmia acuminata A. Gray in Hemsley's list.

Phaleria disperma (Forster f.) Baillon. Adansonia 11: 318, 1875.

Tree, up to 6-8 m. tall. Leaves opposite, oval-oblong, abruptly acuminate, base rounded, obtuse, entire, up to 15 cm. long and 8 cm. wide, glabrous, subcoriaceous, pinnately nerved, petiole scarcely 1 cm. long, reddish, canaliculate. Flowers fragrant, in terminal, compact, several-flowered clusters, tubular, tube up to 5 cm. long, glabrous, lobes four, spreading to about 1 cm. in width, hairy, white; fruit ovoid, up to 2 cm. long.

Tongatapu: in thicket along strand below Navutoka village, Feb. 27, 1953, *Yuncker 15104;* in seaside thicket near Haveluliku, June 3, 1953, *Yuncker 16230;* in thicket, margin of cemetery, near Fu'amotu village, June 5, 1953, *Yuncker 16245.*

'Eua: *Lister;* in Ohonua village, Apr. 2, 1953, *Yuncker 15628.*

Lifuka: on cliff overlooking eastern coast, Apr. 27, 1953, *Yuncker 15761.*

Niuatoputapu: coastal forest near Vaipoa, Dec. 7, 1951, *Hürlimann 376.*

Occasional on cliffs and in thickets. Sometimes planted as an ornamental. Also in Fiji and Samoa.

Leucosmia burnettiana Benth. in Hemsley's list.

Tongan name: *huni.* The leaves and flowers are used in making leis. [824] [301]

Genus **Wikstroemia** Endlicher

Wikstroemia rotundifolia (Forster) Decaisne, Jacquemont Voy., l'Inde 4 (Bot.): 146, 1844.

Shrub, up to 2 or 3 m. tall, twigs puberulent. Leaves opposite, elliptic, oval or oval-subovate, rounded, obtuse or slightly retuse or acutish, base obtuse, up to 5.5 cm. long and 3.5 cm. wide, pinnately nerved, light green above, paler beneath, petiole 1-2 mm. long, pubescent. Flowers several, yellow, tubular, tube about 1 cm. long, sparsely pubescent without, on pubescent terminal and axillary peduncles about 1 cm. long; fruit ovoid, about 5 mm. long, red.

137 Tongatapu: *Nelson.*

'Eua: *Lister;* in thicket at margin of forest near center of island, Mar. 19, 1953, *Yuncker 15341.*

Nomuka: in thicket on seaward side of road encircling island, Apr. 30, 1953, *Yuncker 15822.*

Lifuka: in thicket along road between Pangai village and southern end of village, Apr. 28, 1953, *Yuncker 15782.*

Kao: in opening of slope forest, between rocks, May 6, 1953, *Yuncker 15939.*

Vava'u: *Crosby;* on upper rim of seaside cliff northeast of Leimatua on northern side of island, May 20, 1953, *Yuncker 16066.*

Frequent throughout Tonga. Endemic.

Tongan name: *lala vao.*

824 278 757 An extract of the root[1] is used as a physic.

FAMILY PUNICACEAE

Genus **Punica** Linnaeus

Punica granatum Linnaeus, Sp. Pl. 472, 1753.

Shrub up to about 2 m. tall, branchlets often spinelike at tip. Leaves opposite, entire, mostly elliptic or oblong, up to 8 cm. long and 1.5 cm. wide, glabrous, obtuse or acutish, base wedge-shaped, petiole short, winged. Flowers axillary, showy, 3-4 cm. wide, petals scarlet, stamens numerous; fruit up to 6 cm. or more thick, very juicy, edible, rind leathery.

Introduced and occasional in villages. A native of Persia, now widely cultivated as an ornamental and for its refreshing fruit.

Tongan name: *pomikanite.*

FAMILY BARRINGTONIACEAE

Genus **Barringtonia** Forster

Barringtonia asiatica (Linnaeus) Kurz, Asiatic Soc. Bengal, Jour. 45(2): 131, 1876.

Large, round-topped tree, up to 8 m. or more tall. Leaves alternate, clustered toward ends of branches, obovate, apex rounded, base wedge-shaped, entire, up to about 30 cm. long, somewhat coriaceous, sessile or subsessile on very short petioles. Flowers large, calyx commonly two-parted, sepals concave, obtuse, persistent on fruit, corolla four-parted, white, early deciduous, stamens numerous, pink and white, on pedicels up to 3 cm. or more long, in terminal, racemose clusters; fruit four-angular, pyramidal, about 8 cm. long, fibrous, buoyant, seed large.

Tongatapu: *Forster; Moseley;* near Ha'akame village, Mar. 12, 1953. *Yuncker 15285.*

'Eua: in open forest on terrace, seaward side of coastal cliff, along trail down to Lokupo, Mar. 27, 1953, *Yuncker 15539.*

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[1] /Wikstroemia rotundifolia -- Analyst/

Lifuka: in thicket near sea, north of Pangai village, Apr. 25, 1953, *Yuncker 15753;* on low cliff along eastern side of island, Apr. 21, 1953, *Yuncker 15771.* 137

Vava'u: *Crosby;* in seaside forest below Houma village, May 22, 1953, *Yuncker 16137.*

Tafahi: in forest between township of Tafahi and landing place, Tafe, Dec. 13, 1951, *Hürlimann 504.*

Frequent near shore throughout Tonga. A southern Asiatic species extending to the Philippines and Polynesia.

B. butonica Forst. in Hemsley's list and *B. speciosa* L. f. in Burkill's list.

Tongan name: *futu.*

The timber[1] is used for house construction, banana shooks, and so forth; the trunks, for dugout canoes; and the bark, as a fish poison.

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FAMILY RHIZOPHORACEAE

Genus **Rhizophora** Linnaeus

Rhizophora mangle Linnaeus, Sp. Pl., 443, 1753.

Round-topped, much-branched tree, sometimes up to 10 m. tall, bearing many, pendent, aerial roots which form an impenetrable entanglement. Leaves opposite, elliptic or obovate-elliptic, apex blunt and often slightly notched, base acute and decurrent on petiole, up to 10-12 cm. long and 6-7 cm. wide, somewhat leathery, pinnately nerved, midrib stout, lateral nerves slender. Flowers few, four-parted, about 2 cm. wide, yellow, in simple, axillary, cymose clusters, seed usually germinating while on tree, producing a radicle up to 30 cm. long.

Tongatapu: forming a grove on the tidal flat at Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15023;* May 30, 1953, *Yuncker 16206.*

Nomuka: along shore of large central lake, Apr. 30, 1953, *Yuncker 15847.*

Vava'u: along shore below Houma village, May 22, 1953, *Yuncker 16130;* along shore of lagoon, Vaihoi, near Leimatua village, May 26, 1953, *Yuncker 16185.*

Occasional throughout Tonga. Tropical America and westward to Fiji, Samoa, and Tonga, where it seems to meet but remain distinct from the following species.

Tongan name: *tongolei.*

The timber is durable and used in a variety of ways; the roots are used in house construction; the sap, for dyeing.

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Rhizophora mucronata Lamarck, Encycl. Méth. 6: 189, 1804.

This species closely resembles the preceding, differing chiefly in having sharply pointed leaves.

Vava'u: *Harvey; Crosby.*

Infrequent. A species of the Old World tropics extending into Polynesia.

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[1] /Barringtonia asiatica -- Analyst/

Genus **Bruguiera** Lamarck

137 **Bruguiera conjugata** (Linnaeus) Merrill, Philippine Jour. Sci. **9C**: 118, 1914.

Small tree similar in habit to *Rhizophora*, up to 4 m. or more tall. Leaves alternate, elliptic, acuminate, base decurrent along petiole, up to 12 cm. or more long and 4-5 cm. wide, coriaceous, somewhat glossy, finely pinnately nerved, petiole up to 4 cm. or more long. Flowers greenish yellow, solitary, axillary, about 3 cm. long, calyx lobes very narrowly lanceolate, acute, usually 10, up to 1.5 cm. long; fruit included in calyx tube, seed germinating on tree and forming an elongated radicle.

Nomuka: along shore of central lake, Apr. 30, 1953, *Yuncker 15828.*

Vava'u: *Crosby.*

Occasional near shore but less frequent than *Rhizophora*. From tropical Asia through Malaya to Polynesia.

B. rheedii Blume in Hemsley's list and *B. gymnorhiza* Lam. in Burkill's list.

Tongan names: *tongo, tongo ta'ane.*

824 313 386 The hard and durable wood is used in many ways, and an extract of the flowers furnishes a dye.

FAMILY COMBRETACEAE

Genus **Terminalia** Linnaeus

Terminalia catappa Linnaeus, Mantissa **1**: 128, 1767.

Medium to large tree with whorled, horizontal branches. Leaves clustered toward ends of branches, obovate, obtuse or abruptly acute, base narrowing, narrowly and abruptly obtuse at petiole, entire, up to 25 cm. or more long and 15 cm. wide, pinnately nerved, petioles short and stout. Flowers small, greenish white, in axillary, spikelike clusters near ends of branches; fruit oval, flattened, two-edged, greenish to red, up to about 5 cm. long, flesh thin and edible.

Tongatapu: *U.S. Expl. Exped.*; in open forest near Nualei, Mar. 9, 1953, *Yuncker 15246;* in seaside thicket below Ha'akame village, Mar. 12, 1953, *Yuncker 15286.*

'Eua: in seaward forest on terrace above Houma village, Mar. 26, 1953, *Yuncker 15506.*

Lifuka: roadside near north end of island, Apr. 25, 1953, *Yuncker 15752.*

Tafahi: shore, northeast coast north of Fakafafa moe Tauloto, Dec. 17, 1951, *Hürlimann 601.*

Niuatoputapu: forest on plain southeast of Falehau, alt. 5 m., Dec. 7, 1951, *Hürlimann 385.*

Frequent throughout Tonga, commonly near the shore. From tropical Asia eastward to Polynesia; naturalized in America.

Tongan name: *telie.*

824 313 396 278 262 The timber is used for construction purposes, canoes, banana shooks, and so forth; the leaves, for medicine; and the fruit, as food.

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Terminalia litoralis [*fide* Index Kewensis] Seemann, Fl. Vit., 94, 1865.

Small tree, up to 6 m. or more tall. Leaves clustered near ends of branches, obovate, apex rounded to slightly emarginate, base narrowly obtuse, entire, pinnately nerved, up to 15-18 cm. long and 10-12 cm. wide. Flowers white, small, in narrow, elongated, racemose, axillary clusters; fruit ellipsoidal, up to 2.5 cm. long, somewhat angled but scarcely ridged.

Terminalia litoralis var. **litoralis.**

Branches, leaves, and inflorescence parts glabrous.

Tongatapu: in strand forest below the village of Fu'amotu, Mar. 4, 1953, *Yuncker 15171.*

Nomuka: in thicket near the central lake, along the road encircling the island between the sea and the central lake, Apr. 30, 1953, *Yuncker 15852.*

Terminalia litoralis var. **tomentella** Hemsley, Linn. Soc. Bot., Jour. **30**: 177, 1895, *nomen nudum.*—Burkill, Linn. Soc. Bot., Jour. **36**: 37, 1901.

Young branches, petioles, peduncles, pedicels, and lower leaf surface tomentulose.

Tongatapu: in thicket near shore, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15017, 15021,* May 30, 1953, *Yuncker 15300.*

'Eua: *Lister;* seaward margin of forest on terrace above Houma village, Mar. 26, 1953, *Yuncker 15494.*

Lifuka: *Harvey.*

Vava'u: *Harvey.*

On the basis of the material collected and observed in the field, variety *tomentella* is more common than variety *litoralis.* The species is variable and the status of variety *tomentella* is somewhat questionable. It is frequent in seaside thickets throughout the group. This species also occurs in Fiji and other parts of Polynesia.

Tongan name: *telie'amanu.*

The wood is used to some extent in house construction.

[824]
[342]
[313]

Genus **Lumnitzera** Willdenow

Lumnitzera littorea (Jack) Voigt, Hort. Suburb. Calcut., 39, 1845.

Small, glabrous tree, up to 5 m. or more tall. Leaves alternate, crowded toward the ends of the branches, spatulate, the apex rounded, emarginate, the base cuneate, entire, up to about 8 cm. long, faintly pinnately nerved, subsessile on very short petioles. Flowers about 1 cm. or less wide and 1-2 cm. long, subsessile, in terminal or subterminal, loose, spikelike clusters, the calyx green, the corolla bright red; the fruit ellipsoidal, crowned with the calyx, 2 cm. or more long.

Tongatapu: *U.S. Expl. Exped.;* in seaside thicket, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15020,* May 30, 1953, *Yuncker 16208.*

'Eua: *Lister.*

Locally distributed in Tonga. Along the coasts from tropical Asia to Australia and Polynesia.

Tongan name: *hangale.*

Genus Quisqualis Linnaeus

137 **Quisqualis indica** Linnaeus, Sp. Pl., ed. 2, 556, 1762.

● [824] [245] A tropical Asiatic vine widely planted for ornamental purposes. Occasional about dwellings in Tonga.

[133]

FIGURE 12.—Sinkhole on central plateau of 'Eua island. Much of the "bush" is *Psidium guajava*.

FAMILY MYRTACEAE

Genus Psidium Linnaeus

Psidium guajava Linnaeus, Sp. Pl., 470, 1753 (fig. 12).

Shrub or small tree, up to 3 m. or more tall, young branches quadrangular, pubescent. Leaves simple, opposite, oval-elliptic or oblong, apex rounded, base obtuse or acutish, up to 12 cm. or more long and 6 cm. wide, rather thick, pubescent beneath, prominently pinnately nerved, petiole up to about 1 cm. long. Flowers about 2.5 cm. wide, axillary, corolla white: fruit size of a small lemon, yellow, flesh pink when ripe, fragrant, edible.

Tongatapu: in thicket along road near village of Niutoua, Mar. 2, 1953, *Yuncker 15112*.

Occasional to frequent throughout Tonga; rather large colonies grow on 'Eua. It appears to be spreading in Tonga and promises to become a pernicious weed. A tropical American species of relatively recent introduction.

Tongan name: *kuava*.

[824] [262] The fruit is used as food.

Genus **Decaspermum** Forster

Decaspermum fruticosum J. R. and G. Forster, Char. Gen. Pl., 74, pl. 37, 1776. 137

Pubescent shrub, up to 2 m. or more tall. Leaves opposite, lanceolate or lance-ovate, acute to acuminate, base acute, decurrent on petiole, entire, up to 4 cm. long and 2 cm. wide, pale-glandular-dotted beneath, pinnately nerved, lateral nerves very slender. Flowers about 1 cm. wide, terminal and axillary on small, reduced, axillary branches, corolla white; fruit about 4-5 mm. in diameter, black.

Tongatapu: *U.S. Expl. Exped.; Graeffe.*

'Eua: *Lister;* in thicket at summit of eastern ridge, Mar. 30, 1953, *Yuncker 15555.*

Kao: in margin of lake near summit, about 990 m. alt., May 6, 1953, *Yuncker 16256.*

Vava'u: *Crosby.*

Occasional at upper altitudes throughout Tonga. Occasionally used as an ornamental shrub. Southern Asia, Malaya, and Australia to Polynesia. 245 824

Nelitris fruticosa A. Gray and [?] *N. forsteri* Seem. in Hemsley's and Burkill's lists.

Tongan name: *nukonuka.*

Genus **Eugenia** Linnaeus

Eugenia rariflora Bentham, Hook. London Jour. Bot. 2: 221, 1843.

Low shrub or small tree, up to 4 m. tall. Leaves opposite, elliptic-ovate or elliptic-obovate, obtuse or acutish, base acute, up to 7 cm. or more long and 4-5 cm. wide, entire, glossy above, paler beneath, petioles mostly 2-4 mm. long. Flowers axillary or terminal, corolla white; fruit subspherical, 10 mm. or more in diameter, red.

Tongatapu: *Home;* in dense forest near sea, below village of Lavengatonga, Mar. 6, 1953, *Yuncker 16192.*

'Eua: *Lister.*

Vava'u: *Crosby;* in thicket along the upper rim of the seaside cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16099.*

Occasional throughout Tonga. Pacific islands.

E. rariflora f. *parviflora* Hemsl. in Hemsley's list.

Genus **Syzygium** Gaertner

Syzygium amicorum (A. Gray) C. Mueller, Walpers Ann. Bot. Syst. 4: 839, 1857.

Shrub or small to medium-sized tree with terete branches. Leaves subacuminate, base cuneate, pinnately nerved, lateral nerves obvious. Inflorescences axillary and terminal, open, usually no longer than subtending leaves, flowers white, fruit purplish.

Tongatapu: *Cook; Forster; Home.*

137 Also in Fiji. For a discussion of this species see Lily M. Perry (Jour.
[113] Arnold Arboretum **31**: 363-364, 1950).

Syzygium clusiaefolium (A. Gray) C. Mueller, Walpers Ann. Bot. Syst. **4**: 839, 1857.

Tree, up to 8 m. or more tall. Leaves opposite, oval or oval-obovate, apex rounded, obtuse to short-acute, base acute to cuneate, up to 15 cm. long and 8 cm. wide, coriaceous, entire, pinnately nerved, lateral nerves numerous, very slender, joining with a submarginal nerve, petiole about 1 cm. long, canaliculate. Flowers small, numerous, in large, open, paniculate clusters, borne on trunk and larger branches; fruit ovoid, up to 1 cm. or more in diameter, dark purple, edible.

Tongatapu: swampy area between village of Navutoka and sea, Feb. 27, 1953, *Yuncker 15085*.

'Eua: in open forest near center of island, Mar. 19, 1953, *Yuncker 15386*.

Kao: in forest on rocky slope, May 6, 1953, *Yuncker 15907*.

Vava'u: *Crosby;* near upper rim of seaside cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16108*.

Niuafo'ou: inner slope of main crater, facing large central lake, May 16, 1953, *Yuncker 16005*.

Rather frequent throughout the group. Also in Niue and Samoa.

Eugenia clusiaefolia A. Gr. in Hemsley's list, *fide* Burkill.

Syzygium corynocarpum (A. Gray) C. Mueller, Walpers, Ann. Bot. Syst. **4**: 839, 1857.

Shrub or small tree, up to 7 m. or more tall. Leaves opposite, elliptic or oblong-elliptic, bluntly acuminate, base acute, up to 14 or 15 cm. long and 5 cm. wide but mostly smaller, pinnately nerved, lateral nerves slender and submarginally loop-connected, paler on lower surface, petioles 5 mm. long, canaliculate. Flowers sessile or subsessile; fruit elongated, beaked.

Tongatapu: *Home;* in open forested area near village of Niutoua, Mar. 2, 1953, *Yuncker 15166*.

'Eua: in open forest along trail between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15469*.

Nomuka: in clearing near road encircling island, Apr. 30, 1953, *Yuncker 15833*.

Vava'u: *Crosby*.

Occasional throughout Tonga. Also in Fiji and Samoa.

Tongan name: *hehea*.

[824] The timber is used for construction purposes; the fruit is eaten and used
[313] for leis; and the leaves and bark are used in medicines.
[262]
[301] **Syzygium cumini** (Linnaeus) Skeels, U.S. Dept. Agric., Bur. Pl. Ind., Bull.
[278] **248**: 25, 1912.

Shrub or medium to large tree. Leaves opposite, oblong to oval, obtuse or acute, 8-14 cm. long and 3-6 cm. wide, rather thick and shining, pinnately nerved. Flowers

76: Yuncker N-4,5 (1953) 1959 OU9 Tonga OU9

137 shallowly canaliculate. Flowers large, red, on pedicels 1 cm. or less long, in lateral or terminal, racemose clusters: fruit obovoid, 7 cm. or more in diameter, fleshy, red, one-seeded, edible.

Tongatapu: *U.S. Expl. Exped.;* in open woods near village of Lavengatonga, Mar. 6, 1953, *Yuncker 15178;* in open woods near sea below village of Fatai, Mar. 10, 1953, *Yuncker 15265.*

'Eua: in open forest on sea-facing terrace along trail descending to Lokupo, Mar. 27, 1953, *Yuncker 15529.*

Nomuka: in clearing along road encircling island, Apr. 30, 1953, *Yuncker 15858.*

Lifuka: on limestone cliff along eastern side of island near middle, Apr. 27, 1953, *Yuncker 15772;* margin of plantation near north end of island, May 6, 1953, *Yuncker 15988.*

Vava'u: *Crosby.*

Frequent throughout Tonga. A native of Indo-Malaya, now widely grown in warm countries.

Tongan name: *fekika kai.*

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The timber[1] is used for construction work; the fruit, as food; and the bark and leaves, in medicines.

Syzygium neurocalyx (A. Gray) Christophersen, B. P. Bishop Mus., Bull. 154: 27, 1938.

Shrub or small tree, up to about 4 m. tall. Leaves opposite, oval-oblong or subovate, obtuse, base rounded, truncate or cordulate, up to 18 cm. long and 8 cm. wide, pinnately nerved, lateral nerves submarginally loop-connected, paler beneath, petioles scarcely 5 mm. long, stout. Flowers large, sessile, solitary or in terminal and axillary, headlike clusters, calyx tube ribbed.

Tongatapu: in open forest below Nualei, Mar. 9, 1953, *Yuncker 15247.* This specimen is sterile and only tentatively referred to this species with which it agrees well in its vegetative characters.

Infrequent. Also in Fiji and Samoa.

Tongan name: *koli.*

824
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The fruit is used in leis.

Syzygium richii (A. Gray) Merrill and Perry, Sargentia 1: 77, 1942.

Medium to large tree, up to 8 m. or more tall. Leaves opposite, oval or oval-subobovate, abruptly pointed, base rounded, cordulate, up to 25 cm. or more long and 14 cm. wide, coriaceous, pinnately nerved, lateral nerves submarginally loop-connected. Flowers large, in large, branching, axillary clusters, petals four, white, early deciduous, stamens many, long, yellow; fruit ovoid, red.

Tongatapu: in forest near the sea below the village of Niutoua, Mar. 2, 1953, *Yuncker 15140;* in seaside thicket, Blow Hole area near Houma village, June 5, 1953, *Yuncker 16246.*

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[1] /Syzygium malaccense -- Analyst/

Nomuka: near sea along road encircling island, Apr. 30, 1953, *Yuncker 15813.* 137

Vava'u: *Harvey.*

Frequent near the shore throughout Tonga. Also in Fiji.

Tongan name: *heavula.*

The timber[1] is used for handicraft work.

[824]
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Genus **Metrosideros** Banks

Metrosideros collina (J. R. and G. Forster) A. Gray, U.S. Expl. Exped., Bot. 1: 558, fig. 68, 1854.

Shrub or small tree, up to 15 m. or more tall. Leaves opposite, variable in shape, elliptic, ovate, or suborbicular, obtuse or acute, base rounded, acute, or cordate, about 6 cm. long and 3 cm. wide, or sometimes up to 10 cm. long, pinnately nerved, midrib strong, lateral nerves slender and submarginally united, petiole about 5 mm. long. Flowers subsessile or sessile, in terminal and axillary, cymose clusters of three to five flowers, red or yellow.

Tongatapu: *Beechey.*

Vava'u: *Harvey.*

Infrequent. Throughout Polynesia.

M. polymorpha Gaudichaud in Hemsley's list.

Genus **Eucalyptus** L'Héritier

Eucalyptus spp.

Occasional specimens of introduced, unidentified species of *Eucalyptus* were noted on Tongatapu.

FAMILY MELASTOMACEAE

Genus **Melastoma** Burmann

Melastoma denticulatum Labillardière, Sertum Austro-Caledonicum 1: 65, pl. 64, 1824.

Branched, spreading shrub, up to 2 m. tall. Leaves simple, opposite, ovate or ovate-lanceolate, acuminate, base rounded, obtuse or acute, up to 10 cm. long and 3 cm. wide, palmately five-nerved, the three inner nerves prominent, leaves and twigs covered with stiff, flat, setose, appressed hairs, petiole up to about 1 cm. long. Flowers pinkish white, 1-2 cm. wide, clustered at ends of branches, calyx densely covered with appressed, scabrous hairs.

'Eua: *Lister;* on sides of old sinkhole along trail near center of island, Mar. 20, 1953, *Yuncker 15373.*

Kao: at margin of upper forest limit, about 480 m. alt., May 6, 1953, *Yuncker 15905.*

Occasional on the higher islands. Also in New Caledonia, Fiji, and Society Islands.

Tongan name: *pesikuku.*

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[1] /Syzygium richii -- Analyst/

Genus **Memecylon** Linnaeus

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Memecylon harveyi Seemann, Fl. Vit., 85, 1865.

Small, glabrous tree, up to 6 m. or more tall. Leaves somewhat coriaceous, opposite, elliptic, acuminate, base acute, up to 10 cm. or more long and 4 cm. wide, entire, pinnately nerved, lateral nerves very slender, petiole scarcely 1 cm. long. Flowers four-parted, axillary; fruit globose, one-seeded, about 1 cm. in diameter, crowned by calyx.

'Eua: *Lister;* in forest near center of island, Apr. 5, 1953, *Yuncker 15649;* Mar. 20, 1953, *Yuncker 15380.*

Vava'u: *Crosby; Harvey;* in forest on upper rim of limestone coastal cliff on northwestern side of island, May 25, 1953, *Yuncker 16173.*

Occasional. Endemic.

Tongan names: *vitahi, malamala'a toa.*

FAMILY ONAGRACEAE

Genus **Jussiaea** Linnaeus

Jussiaea erecta Linnaeus, Sp. Pl., 388, 1753.

Erect, branched herb, stem green to reddish, longitudinally ridged, ciliate. Leaves alternate, linear-lanceolate, acute at both ends, up to 7 cm. long and 1 cm. wide, pinnately nerved, subsessile or on short petioles. Flower buds four-angled, peduncle about 1.5 cm. long, calyx tube about 2 cm. long, four-lobed, corolla yellow, petals four, spreading; capsule cylindrical, longitudinally ridged, ascending.

Tongatapu: moist area along road near Navutoka village, Feb. 27, 1953, *Yuncker 15070.*

'Eua: in marshy margin of waterhole on upper grazing plain near center of island, Mar. 24, 1953, *Yuncker 15447.*

Occasional in moist areas. India, southern China, Borneo, Philippines, and Polynesia.

Tongan name: *loa ano.*

[824] [386] The plant produces a dye used to color pandanus leaves for weaving.

FAMILY ARALIACEAE

Genus **Mertya** Forster

Mertya macrophylla (Richard) Seemann, Bonplandia 10: 294, 1862.

Rather small, slender tree, up to 5-7 m. tall. Leaves alternate, simple, clustered toward ends of branches, elliptic-oblanceolate, acute at both ends, up to 50 cm. or more long and 12-15 cm. wide, pinnately nerved, petioles stout, 5-8 cm. long. Flowers dioecious, greenish, in capitate clusters, in large, branching, terminal inflorescences.

Tongatapu: *U.S. Expl. Exped.*

'Eua: *Lister;* in thicket on limestone outcrop on sea-facing cliff near summit of eastern ridge, above Fuai, Apr. 8, 1953, *Yuncker 15688.*

Vava'u: *Crosby;* in forest on slope above Anovai Lake, May 18, 1953, *Yuncker 16050;* near upper edge of seaside cliff along northwestern side of island, May 25, 1953, *Yuncker 16181.* 137

In forests and thickets, usually on seaside cliffs. Also in Samoa.

Tongan name: ***kulukulu.***

The large leaves are used for wrapping fish.[1] [824] [251]

Genus **Polyscias** Forster

Polyscias multijuga (A. Gray) Harms, in Engler and Prantl, Nat. Pflanzenfam. 3(8): 45, 1894.

Small tree with thick, pithy stems and branches, up to 5 m. tall. Leaves pinnate, leaflets 9-13, oval-oblong, acuminate, base more or less inequilaterally obtuse, entire, up to 15 cm. or more long and 6 cm. wide, pinnately nerved, petioles vaginate and winged toward base, clasping. Flowers very small, numerous, in large, branching, axillary clusters, up to 60 cm. or more long.

Tongatapu: in dense thicket near shore, Blow Hole area, near Houma village, June 1, 1953, *Yuncker 16227.*

'Eua: *Lister.*

Locally abundant. Also on Niue Island.

Panax multijugum Benth. and Hook. f. in Hemsley's list.

Tongan name: ***tanetane.***

Genus **Nothopanax** Miquel

Nothopanax fruticosum (Linnaeus) Miquel, Fl. Ind. Bat. 1(1): 765, 1856.

Glabrous shrub, up to 3 m. or more tall. Leaves decompound, up to 30 cm. or more long, leaflets quite variable in form, often more or less lanceolate, often laciniated and spiny-toothed, up to 10 cm. long, terminal leaflet usually largest, often with white margins. Flowers small, greenish white, in small umbels, forming large, terminal, paniculate clusters; fruit flattened, ribbed.

Tongatapu: *Home.*

A tropical Asiatic plant of frequent cultivation in Polynesia as an ornamental. The various forms have been given varietal names.

Reported by Hemsley in his list as *Panax fruticosum* L.

Nothopanax guilfoylei (Cogniaux and Marché) Merrill, Philippine Jour. Sci. 7C: 242, 1912.

Shrub or small tree up to 3 m. or more tall, with abruptly ascending branches. Leaves alternate, odd-pinnate, green with white margins, leaflets coarsely sharp-toothed, mostly five or seven, terminal leaflet largest, petiole clasping stem. Flowers and fruit rare, in terminal, racemose clusters.

An introduced ornamental, commonly planted in hedges or about dwellings. Pantropic. This species occurs in a number of varieties showing differences in the character of the leaflets, two or three of which were noted in Tonga. [824] [245] [351]

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[1] / Mertya macrophylla -- Analyst/

137 Tongan names for the different varieties: *tanetane, tanetane tamaline, tanetane kau'uli, tanetane maelieli.*

FAMILY UMBELLIFERAE

Genus **Centella** Linnaeus

Centella asiatica (Linnaeus) Urban, in Martius Fl. Brasil. **11**(1): 287, 1879.

Low, prostrate, silky-hairy herb, widely spreading by slender, runnerlike stems, rooting at nodes. Leaves clustered at nodes, orbicular-ovate, rather thick, crenately toothed, base deeply cordate, petioles long. Flowers very small, white or pinkish, nearly sessile, in axillary, few-flowered, headlike umbels; fruit round, compressed, ribbed.

Tongatapu: in sand, along strand, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15010;* in sandy soil just above high-tide limit, in thicket near Fu'amotu village, Mar. 4, 1953, *Yuncker 15146.*

'Eua: *Lister;* in an eroded area near ridge forest, on eastern side of island, Mar. 24, 1953, *Yuncker 15448.*

Kao: in open alpine area above upper forest limit, about 950 m. alt., May 6, 1953, *Yuncker 15941.*

Vava'u: *Barclay; Crosby.*

Tafahi: township of Tafahi to landing place Faihavanui, alt. 100 m., Dec. 15, 1951, *Hürlimann 539.*

Found throughout Tonga as a frequent plantation and waste-area weed. Pantropic.

Hydrocotyle asiatica L. in Hemsley's and Burkill's lists.

Tongan name: *tono.*

[824] [278] The leaves are used medicinally, as poultices, for one thing.

Genus **Apium** Linnaeus

Apium leptophyllum (Persoon) F. Mueller, ex Bentham, Fl. Australiensis **2**: 372, 1866.

Erect, glabrous herb. Leaves alternate, divided into numerous, filiform divisions. Flowers minute, white, in terminal or leaf-opposed, few-flowered umbels; the fruit very small, ovate, compressed, ribbed.

Tongatapu: weedy area between Fu'amotu village and sea, Mar. 4, 1953, *Yuncker 15155.*

'Eua: grassy area near center of island, Mar. 22, 1953, *Yuncker 15413.*

Vava'u: *Crosby.*

Occasional throughout Tonga as a plantation and waste-area weed. A common weed of tropical and subtropical America, now widespread in the Pacific area.

Of this family[1] carrots (*Daucus carota* L. var. *sativa* DC.), parsnips 137
(*Pastinaca sativa* L.), and celery (*Apium graveolens* L. var. *dulce* DC.) are 262
cultivated to some extent as food crops. 829
249

FAMILY MYRSINACEAE

Genus **Maesa** Forskål

Maesa tongensis Mez, in Engler, Pflanzenr. 9 (IV. 236): 43, 1902.

Shrub or small tree, branches sometimes somewhat scandent, up to 3 m. or more tall. Leaves alternate, elliptic-obovate, apex rounded, base obtuse to acute, up to 12 cm. long and 8 cm. wide, margin entire or uneven, pinnately nerved, nerves, petioles and twigs reddish, petiole up to 2-3 cm. long. Flowers small, in axillary, racemose or paniculate clusters; fruit subglobose, pointed, about 3 mm. in diameter, white.

Tongatapu: climbing in thicket near sea below Fu'amotu village, June 5, 1953, *Yuncker 16244;* roadside, Vahe, *Setchell and Parks 15434.*

'Eua: on seaward terrace of coastal cliff, in thicket along trail down to Lokupo, Mar. 27, 1953, *Yuncker 15527;* on seaward-facing limestone cliff, summit of the eastern ridge, Apr. 8, 1953, *Yuncker 15686.*

Occasional.

Tongan name: *puataukanave.*

M. nemoralis A. DC. and *M. vitiensis* Seem. were included in Hemsley's list, and the former also in Burkill's list. *M. nemoralis* was described from a New Hebrides collection, and there is some doubt as to its occurrence in Tonga. *M. vitiensis* is referred by Mez to synonymy under *M. persicifolia,* a common and presumably Fijian endemic. It appears rather doubtful, therefore, that it occurs in Tonga.

Maesa sp. [?]

Scandent shrublike plant, climbing in thicket. Leaves oval-ovate, acuminate, base obtuse, up to 12 cm. long and 8 cm. wide, thin, entire, pinnately nerved, nerves reddish, petioles about 1 cm. long, slender. Flowers and fruit lacking.

'Eua: in shrubbery thicket in opening in forest near "Smoky Hole" above Fuai plantation, Mar. 31, 1953, *Yuncker 15572.*

Tongan name: *tuamea.*

Genus **Discocalyx** Mez

Discocalyx listeri (Stapf) Mez and Stapf, Pflanzenr. 9 [IV. 236]: 212, 1902.

Glabrous shrub up to 2 m. tall. Leaves alternate, oblong or oblanceolate, up to 15 cm. long and 4-5 cm. wide, obtuse, base narrowed, pinnately nerved, petiole up to 2 cm. long. Flowers small, in terminal panicles.

'Eua: *Lister.*

Presumably endemic to 'Eua. Only the type is cited by Mez.

Ardisia listeri Stapf in Hemsley's list.

[1] /Apium leptophyllum -- Analyst/

FAMILY PLUMBAGINACEAE

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Genus **Plumbago** Linnaeus

Plumbago capensis Thunberg, Prodr. Fl. Cap., 33, 1794.

Smooth shrub with long, slender, furrowed branches, often somewhat scandent in trees or shrubs. Leaves oblong, obtuse, narrowing to short petiole. Flowers light blue, clustered near ends of branches, corolla tubular with spreading lobes, tube up to about 3 cm. long, calyx with glandular hairs.

[829] [245] Cultivated in villages as an ornamental. A South African species now widely cultivated in warm climates.

FAMILY SAPOTACEAE

Genus **Burckella** Pierre

Burckella richii (A. Gray) H. J. Lam, Blumea 6: 592, 1952.

Tree, up to 15 m. tall, trunk 35-75 cm. in diameter, latex milky. Leaves clustered toward ends of branches, elliptic or elliptic-obovate, apex rounded or bluntly pointed, base acute to cuneate, firm, entire, pinnately nerved, lateral nerves slender, up to 14 or 15 cm. long and 6 or 7 cm. wide but mostly smaller, petiole mostly 1-5 cm. long. Flowers white, 1-2 cm. wide, attractive, on pedicels up to 2 cm. or more long, in terminal fascicles; fruit ellipsoidal, up to 3.5 cm. long and 2.5 cm. thick, one-seeded, short-stipitate, smooth, apiculate with thickened style base about 5 mm. long.

Tongatapu: near village of Niutoua on eastern side of island, Mar. 2, 1953, *Yuncker 15120*; in open area near Mua village toward eastern end of island, June 3, 1953, *Yuncker 16237*.

Nomuka: in thicket on lake side of road encircling island between sea and central lake, Apr. 30, 1953, *Yuncker 15859*.

Lifuka: edge of Pangai village, Apr. 28, 1953, *Yuncker 15789*.

Tonga, without other locality, *U.S. Expl. Exped.* (US 653903).

In making this combination, Lam cited only the type (U.S. Expl. Exped.: US 65307), which is from Tongatapu. This specimen is quite identical in foliage with those cited above, but the single flower now available seems to be underdeveloped. The relationship of *B. richii* to the more recently described *B. microphylla* H. J. Lam and van Olden (B. P. Bishop Mus., Bull. 154: 34, pl. 1, *B*, 1938) should be investigated in the light of the new collections. *B. microphylla* is mentioned as occurring in Samoa and Tonga, the type specimen being from Vava'u and a second Tongan specimen, from Tongatapu. Significantly, the Tongan name is given as *kau*. On the basis of the original description and plate, *B. microphylla* may not be separable from *B. richii*. (A. C. Smith.)

Niuatoputapu: range above Hihifo, alt. 100 m., Dec. 12, 1951, *Hürlimann 345;* forest, coastal flat south of Falehau, Dec. 28, 1951, *Hürlimann 642.* 137

Southeastern Asia, Malaysia, New Caledonia to Samoa.

Maba elliptica Forst. in Hemsley's and Burkill's lists.

Diospyros ferrea (Willdenow) Bakhuizen, Gard. Bull. Straits Settlem. **7**: 162, 1932.

Tree up to 6 m. or more tall. Leaves alternate, coriaceous, glossy, somewhat hairy or glabrate, elliptic, ovate, or elliptic-subobovate, the apex rounded or slightly pointed, base acute or obtusish, up to 8 cm. long and 4 cm. wide, petiole scarcely 5 mm. long. Flowers small, greenish yellow, three-parted, hairy, in small, axillary, branching clusters; fruit orange, red, or purple, elliptical or globose, up to 1 cm. or more in diameter, edible.

Tongatapu: in forested area between Niutoua village and the sea, Mar. 2, 1953, *Yuncker 15124.*

'Eua: *Lister;* in seaward margin of forest above Houma village, Mar. 26, 1953, *Yuncker 15493.*

Nomuka: in thicket near shore of central lake, Apr. 30, 1953, *Yuncker 15842.*

Lifuka: in thicket near sea, north of Pangai village, Apr. 25, 1953, *Yuncker 15735.*

Vava'u: in thicket near sea below Houma village, May 22, 1953, *Yuncker 16131;* at summit of Talau, west of Neiafu, May 23, 1953, *Yuncker 16144.*

Frequent throughout Tonga. India and Ceylon eastward to the Hawaiian Islands.

Maba buxifolia (Rottb.) Pers. in Hemsley's list.

Tongan name: *kanume.*

The wood is used in handicraft work and the bark in preparing medicines.

[824]
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[278]

Diospyros lateriflora (Hiern) Bakhuizen, Jard. Bot. Buitenzorg, Bull. III, **15**: 8, in key, 1936.

Tree, up to 7 m. or more tall. Leaves alternate, entire, elliptic-ovate, coriaceous, glossy, up to 16 cm. or more long and 9 cm. wide, apex rounded or bluntly acute, base acute, pinnately nerved, petiole scarcely 1 cm. long. Flowers small, hairy, in small, compact, axillary clusters; fruit elliptical, pubescent, up to 4 cm. long.

Tongatapu: in open forest below Nualei village, Mar. 9, 1953, *Yuncker 15236.*

'Eua: in open forest about center of island, Mar. 19, 1953, *Yuncker 15355.*

Lifuka: in seaside thicket near southern end of island, Apr. 28, 1953, *Yuncker 15777.*

Vava'u: *Crosby.*

Occasional throughout Tonga; also in Fiji.

Maba lateriflora Hiern of Burkill's list.

Tongan name: *mapa.*

The fruit is used in leis.

[824]
[301]

137 **Diospyros samoensis** A. Gray, Am. Acad. Arts Sci., Proc. 5: 326, 1862.

Tree, up to 10 m. or more tall. Leaves alternate, coriaceous, glossy, entire, elliptic-ovate, acute at both ends, up to 15 cm. or more long and 6 cm. wide, pinnately nerved, glabrous, petiole scarcely 1 cm. long. Flowers solitary or in small axillary clusters, corolla fleshy, cream color; fruit subglobose, 1 cm. or more in diameter.

‘Eua: seaward margin of forest on terrace above village of Houma, Mar. 26, 1953, *Yuncker 15495, 15496*; in forest on seaward terrace along trail descending to Lokupo, Mar. 27, 1953, *Yuncker 15521*.

Kao: in open forest on steep rocky slope, May 6, 1953, *Yuncker 15967*.

Vava‘u: in open forest on slope leading to lagoon below Leimatua, May 26, 1953, *Yuncker 16191*.

Niuafo‘ou: inner margin of big crater mouth between Futu and great lake, alt. 60 m., Jan. 7, 1952, *Hürlimann 661*.

Tafahi: forest below top of Piu ‘o Tafahi, alt. 590 m., Dec. 12, 1951, *Hürlimann 461*.

Niuatoputapu: forest, range above Vaipoa, alt. 105 m., Dec. 5, 1951, *Hürlimann 352, 361*.

Occasional on the higher islands. Also in Fiji and Samoa.

Tongan names: *tutuna, kakala‘uli, kolivao.*

824 313 The timber is considered excellent as firewood.

FAMILY OLEACEAE

Genus **Linociera** Swartz

Linociera sp.

Tree, up to about 8 m. tall. Leaves opposite or essentially so, elliptic-oblong, attenuate, base cuneate, up to about 15 cm. long and 6 cm. wide, glabrous, entire, pinnately nerved with prominent midrib, petioles up to about 1.5 cm. long. Flowers small, white, four-parted, very fragrant, in small, axillary and terminal, lilac-like clusters.

Vava‘u: *Crosby.*

Tafahi: Tafahi to landing place, Tafe, alt. 5 m., Dec. 13, 1951, *Hürlimann 509.*

Infrequent. Also in Niue.

L. pauciflora C. B. Clarke in Burkill's list. It appears unlikely that the plants of Tonga and Niue can represent this species, the type of which was from Penang and which probably does not extend into the Pacific area. The Tongan specimens need further study to determine their status. For a discussion of this question see A. C. Smith (Torrey Bot. Club, Bull 70: 548-549, 1943).

Genus **Jasminum** Linnaeus

Jasminum didymum Forster f., Fl. Ins. Australia, Prodr., 3, 1786.

High-climbing woody vine. Leaves opposite, three-parted, leaflets ovate, acute, base acute or obtusish, terminal leaflet up to 7 cm. or more long and 5 cm. wide, lateral leaflets

somewhat smaller, three- to five-nerved from base, midrib branched upward, somewhat leathery. Flowers white, about 1 cm. long, very fragrant, in branching, many-flowered, axillary or terminal cymose clusters; fruit subglobose, about 1 cm. in diameter, becoming black. 137

Tongatapu: *Graeffe;* climbing to top of tall forest tree, below village of Lavengatonga, Mar. 6. 1953, ***Yuncker 15194.***

'Eua: *Lister.*

Vava'u: ***Crosby.***

Niuafo'ou: in thicket in "island" in old lava flow, along way to upper rim of main crater, May 16. 1953. *Yuncker 16004.*

Niuatoputapu: forest, top of ridge east of Vaipoa, alt. 150 m., Dec. 5, 1951. *Hürlimann 365.*

Occasional throughout Tonga. From Java to Philippines, New Caledonia, and Polynesia.

Tongan name: *tutu'uli.*

The juice of the fruit[1] may be used as an ink substitute. [824] [212]

Jasminum simplicifolium Forster f., Fl. Ins. Australia, Prodr., 3, 1786.

Woody, trailing or climbing vine, with many, slender, glabrous branches. Leaves simple, opposite, ovate, acute, base obtuse, entire, up to about 10 cm. long and 4.5 cm. wide, petioles up to about 1.5 cm. long. Flowers white, fragrant, about 2 cm. wide, in axillary, branching, cymose clusters; fruit black.

Tongatapu: *Forster; Moseley;* in thicket along coast, near Fu'amotu village, Mar. 4, 1953, ***Yuncker 15148.***

'Eua: ***Lister.***

Nomuka: climbing in tree in thicket between inland lake and sea, Apr. 30, 1953, *Yuncker 15840.*

Vava'u: ***Crosby.***

Occasional throughout the group. From the Solomon Islands, Australia, and the New Hebrides to Fiji and Polynesia.

Tongan name: ***tutu'uli.***

The juice of the fruit may be used as an ink substitute. [824] [212]

FAMILY LOGANIACEAE

Genus Geniostoma Forster

Geniostoma calcicola A. C. Smith, Sargentia 1:99, 1942.

Small tree, up to 4 or 5 m. tall, with four-angled twigs; twigs, petioles, and nerves on lower leaf surface brown-hairy. Leaves opposite, elliptic-oblong or ovate, subacute, base rounded and obtuse or acutish, entire, up to 8 cm. long and 4 cm. wide, pinnately nerved, petiole about 5 mm. long. Flowers very small, greenish white, on slender pedicels, in few-flowered, axillary, cymose clusters; fruit ovoid, 5-8 mm. long.

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[1] /Jasminum didymum -- Analyst/

The genus *Geniostoma* is in need of revision, and some of the specimens listed are only tentatively identified as indicated. 137

The Tongans, so far as I learned, do not distinguish between the different species but call all of them *te'epilo'amaui.* [824]

The bark[1] when bruised, and the flowers, have a disagreeable odor; they are used in medicines. [278]

Genus **Fagraea** Thunberg

Fagraea berteriana A. Gray, Linn. Soc. Bot., Jour. 1: 98, 1857.

Medium to large tree. Leaves simple, opposite, oval-obovate, the apex rounded, obtuse, base cuneate, entire, rather thick, pinnately nerved, midrib stout, lateral branches slender and obscure, up to 15 cm. or more long and 8 cm. wide, petiole up to 2.5 cm. long. Flowers fleshy, very fragrant, nearly 5 cm. wide, in axillary, cymose clusters, corolla white turning yellow, tubular, the tube up to 5 cm. long; fruit ellipsoidal, about 3 cm. long, bright red when ripe.

Tongatapu: *Moseley;* in thicket near village of Nualei, Mar. 9, 1953, *Yuncker 15245.*

'Eua: *Lister,* in open forested area near center of island, Mar. 18, 1953, *Yuncker 15334.*

Vava'u: *Crosby.*

Tafahi: fog forest, former mouth of volcano Piu 'o Tafahi, alt. 580 m., Dec. 11, 1951, *Hürlimann 440.*

Frequent in open forests throughout Tonga. From New Caledonia, Fiji and Samoa to the Marquesas.

Tongan name: *pua.*

The flowers are used in leis. [824] [301]

FAMILY APOCYNACEAE

Genus **Melodinus** Forster

Melodinus vitiense Rolfe, Jour. Bot. 21: 201, 1883.

Woody, vinelike plant. Leaves opposite, elliptic, apex bluntly pointed, base acute, up to 9 cm. or more long and 4 cm. wide, rather thick, glossy above, pinnately nerved, lateral nerves slender and submarginally loop-connected, petioles about 5 mm. long. Flowers about 6-8 mm. long, short-pedicellate, in axillary and terminal, short-pedunculate, few-flowered clusters, corolla tubular, yellow.

Tongatapu: *Forster; Nelson.*

'Eua: *Lister;* in open forest near center of island, Mar. 19, 1953, *Yuncker 15359;* climbing in thicket along trail on terrace of seaside cliff above Houma village, Mar. 26, 1953, *Yuncker 15498.*

Vava'u: *Crosby.*

Occasional. New Caledonia and Fiji.

M. scandens Forst. in Hemsley's list.

[1] /?Geniostoma vitiense -- Analyst/

Genus **Allamanda** Linnaeus

137 **Allamanda cathartica** Linnaeus var. **hendersonii** (Bull) Bailey and Rafill, Standard Cycl. Hort. 1: 247, 1914.

Woody, vinelike shrub. Leaves opposite or in whorls of three or four, elliptical to subobovate, abruptly acuminate, entire, thick and somewhat coriaceous, midrib prominent, petiole very short. Flowers in axillary and terminal, racemose clusters, corolla yellow, trumpet-shaped, up to 7 cm. or more long, with broad, spreading, rounded lobes; fruit a prickly capsule.

[247] [824] Introduced and cultivated for its large and handsome flowers. Frequent in villages. A South American species, now widely cultivated in warm countries.

Genus **Plumeria** Linnaeus

Plumeria acuminata Aiton, Hort. Kew. ed. 2, 2: 70, 1811.

Small, soft-wooded, glabrous tree with thick, spreading branches. Leaves alternate, clustered near ends of branches, elliptic-oblong, acuminate-cuspidate, up to 40 cm. or more long and 6-8 cm. wide, pinnately nerved, midrib prominent, lateral nerves loop-connected near margin, glabrous, petiole stout, up to 6 cm. or more long. Flowers very fragrant, in terminal, cymose clusters, corolla cream or yellowish white, salverform, lobes obovate, longer than tube.

Introduced ornamental. Frequent in villages. A tropical American species now widely cultivated in warm countries.

Tongan name: *kalosipani.*

Plumeria rubra Linnaeus, Sp. Pl., 209, 1753.

Shrub or small tree similar to *P. acuminata* but with pink or red flowers.

An introduced ornamental. Occasional in villages. A tropical American species now widely cultivated in warm countries though usually less frequent than the preceding.

Genus **Alstonia** R. Brown

Alstonia reineckeana Lauterbach, Engler Bot. Jahrb. 41: 233, 1908.

Shrub or small tree up to 3 m. or more tall, with milky latex. Leaves opposite, oval-oblong, acute at both ends, up to 16 cm. or more long and 7 cm. wide, pinnately nerved, petiole 1-2 cm. long. Flowers on slender pedicels in spreading, pedunculate, axillary clusters, corolla tubular, white, about 1 cm. long; fruit paired, curved, acute, orange-colored.

'Eua: margin of forest near center of island, Mar. 19, 1953, *Yuncker 15342.*

Vava'u: near upper rim of seaside cliff, above Ha'alaufuli, May 21, 1953, *Yuncker 16110.*

Occasional. Also in Samoa and Fiji.

Genus **Catharanthus** G. Don

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Catharanthus roseus (Linnaeus) G. Don, Gen. Syst. 4: 95, 1838.

Perennial herb, stem up to 50 cm. or more tall. Leaves opposite, oblong, apex rounded, tipped with a short point, base acute, up to 8 cm. long and 2-3 cm. wide. Flowers in pairs, axillary, corolla white, pink, or white with a red center, puberulent without, salverform, tube up to 3 cm. long; fruit paired follicles, up to 3 cm. long, puberulent.

Tongatapu: roadside near Nuku'alofa, Mar. 10, 1953, *Yuncker 16259.*

'Eua: *Lister.*

Frequent about villages and cemeteries as an ornamental throughout the group. Also naturalized along roadsides and waste areas. A tropical American species of worldwide distribution.

Vinca rosea L. in Hemsley's and Burkill's lists.

Parts of the plant are used in the preparation of medicines.

Tongan names: *lolie, valeti.*

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Genus **Ervatamia** (A. de Candolle) Stapf

Ervatamia orientalis (R. Brown) Turrill, Linn. Soc. Bot., Jour. **43**: 32, 1915.

Small tree, up to 5 m. or more tall, with white latex. Leaves rather thin, elliptical, acute at both ends, up to 15 cm. or more long and 6 cm. wide, glabrous, entire, pinnately nerved, petiole 1-2 cm. long. Flowers in axillary or terminal clusters, corolla white, tubular; fruits orange, paired, podlike, divergent.

Tongatapu: *Nelson;* in open forest between village of Niutou and sea, Mar. 2, 1953, *Yuncker 15123.*

'Eua: *Lister.*

Vava'u: *Crosby.*

Niuatoputapu: Falehau, alt. 5 m., Dec. 18, 1951, *R. Hinango* (*Hürlimann 622*).

Occasional. Fiji to the Society Islands and Samoa.

Tabernaemontana orientalis R. Br. in Hemsley's and Burkill's lists.

Tongan name: *te'ete'emanu.*

Genus **Alyxia** R. Brown

Alyxia bracteolosa Rich, ex A. Gray, Am. Acad. Arts Sci., Proc. **5**: 332, 1862.

Woody vine, with white latex. Leaves in whorls of three, oblong-elliptic, apex rounded or bluntly short-pointed, base cuneate, entire, up to 12 cm. long and 3 cm. wide, pinnately nerved, lateral nerves slender and obscure, petiole scarcely 1 cm. long, canaliculate, narrowly margined by decurrent blade margins.

Tongatapu: *Nelson.*

'Eua: climbing in forest on sea-facing terrace along trail to Lokupo, Mar. 27, 1953, *Yuncker 15515.*

Occasional. Also in Fiji and Samoa.

Tongan name: *kulu.*

The leafy branches are used in making leis.

[824]
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137 **Alyxia scandens** (Forster f.) Roemer and Schultes, Syst. 4: 440, 1819.

Similar to *A. stellata* in growth habit, but leaves commonly opposite and petioles about 10 mm. long.

'Eua: *Lister.*

Infrequent. Eastward to Tuamotu Islands.

Alyxia stellata (Forster f.) Roemer and Schultes, Syst. 4: 439, 1819.

Shrub, commonly more or less scandent with long slender branches. Leaves in whorls of three, or less frequently opposite, elliptical, apex bluntly pointed, base acute, mostly less than 5 or 6 cm. long and 1-2 cm. wide, finely and obscurely pinnately nerved, glossy, glabrous, subsessile, petioles mostly scarcely 5 mm. long. Flowers less than 1 cm. long, in axillary cymes, corolla tubular, cream- or orange-colored; fruit about 1 cm. long, ellipsoid or ovoid, longitudinally lined, black when mature.

Tongatapu: *Forster; Nelson; Moseley;* swampy area between Navutoka village and sea, Feb. 27, 1953, *Yuncker 15074.*

'Eua: *Lister;* along trail to eastern ridge, above Fuai plantation, Mar. 21, 1953, *Yuncker 15394;* limestone cliff facing sea, near summit of eastern ridge, Lokupo District, Apr. 8, 1953, *Yuncker 15673.*

Nomuka: in thicket near inland lake along road encircling island, Apr. 30, 1953, *Yuncker 15846.*

Lifuka: near cemetery, south of Pangai village, Apr. 29, 1953, *Yuncker 15778.*

Kao: margin of forest on lower slope, May 6, 1953, *Yuncker 15892.*

Vava'u: *Crosby;* in thicket near rim of seaside cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16097.*

Tafahi: forest, township of Tafahi to Piu 'o Tafahi, alt. 150 m., Dec. 10, 1951, *Hürlimann 405.*

Niuatoputapu: ridge above Hihifo, alt. 100 m., Dec. 5, 1951, *Hürlimann 347;* forest, end of ridge toward Falehau, alt. 100 m., Dec. 5, 1951, *Hürlimann 368.*

Frequent throughout Tonga. Marquesas, Society, and Austral Islands westward to New Caledonia and perhaps farther west.

Tongan name: *maile.*

[824] [301] The fragrant, long, slender stems and leaves are much used in leis.

Genus **Ochrosia** Jussieu

Ochrosia oppositifolia (Lamarck) K. Schumann, in Engler and Prantl, Nat. Pflanzenfam. 4(2): 156, 1895.

Medium-sized tree, up to 9 or 10 m. tall, latex milky. Leaves opposite, oval-obovate or oval, apex very abruptly short-pointed, base cuneate-decurrent, up to 25 cm. long and 10 cm. wide, rather thick, smooth, entire, pinnately nerved, lateral nerves slender, the petiole up to 3-4 cm. long, narrowly ridged by decurrent blade margins. Flowers small, fragrant, in axillary and terminal, many-flowered, cymose clusters, on peduncles 7-8 cm. or more long, corolla white, scarcely 1 cm. long; fruit commonly paired, 5 cm. or more long.

Tongatapu: *Nelson;* near Niutoua village, Mar 2, 1953, *Yuncker 15141.* 137

'Eua: in forest on seaward side of cliff above Houma village, Mar. 26, 1953, *Yuncker 15509.*

Kao: lower margin of forest near an old plantation, May 6, 1953, *Yuncker 15969.*

Vava'u: *Crosby.*

Occasional throughout Tonga at low altitudes. Philippines, Micronesia, and New Caledonia east to the Societies and Marquesas.

O. parviflora (Forst.) Hemsl. in Hemsley's and Burkill's lists.

Tongan name: *fao.*

The wood[1] is used for construction work and the leaves to wrap fish for baking. The seeds are edible. [824] [313] [252] [262]

Genus Bleekeria Hasskarl

Bleekeria vitiensis (Markgraf) A. C. Smith, Torrey Bot. Club, Bull. 70: 549, 1943.

Tree up to 7 m. or more tall, latex white. Leaves whorled, elliptic-oblanceolate, acute, base cuneate-decurrent, up to 12 cm. or more long and 3 cm. wide, pinnately nerved, lateral nerves very slender, somewhat coriaceous, petiole about 1 cm. long, ridged by decurrent blade margins. Flowers white, in axillary cymose clusters; fruit compressed-elliptic, in pairs, about 4 cm. long and 2 cm. wide.

Vava'u on upper rim of seaside cliff above Ha'alaufuli on northeastern side of island, alt. about 120 m., May 21, 1953, *Yuncker 16107.*

Tongan name: *toto hina.*

The cited specimen, with both flowers and fruits, does not differ essentially from the specimens listed by Markgraf as *Excavatia vitiensis* (B. P. Bishop Mus., Bull. 141: 127, fig. 66, *b, c,* 1936) from the Lau Islands of Fiji. [113] A probable record of this species in Tonga was noted by Burkill (Linn. Soc. Bot., Jour. 35: 46, 1901) as *Ochrosia elliptica* Labill., a species properly known as *Bleekeria elliptica* (Labill.) Koidz. and perhaps occurring no farther east than the larger islands of Fiji. (A. C. Smith.) [113]

Genus Cerbera Linnaeus

Cerbera manghas Linnaeus, Sp. Pl., 208, 1753.

Small tree, up to 7 m. or more tall. Leaves simple, entire, glossy, spirally and closely arranged, lanceolate or obovate-lanceolate, acuminate, base acute-decurrent, up to 20-30 cm. long and 5-8 cm. wide, petiole 2-3 cm. long, narrowly winged by decurrent blade margins. Flowers in long-pedunculate, branching, terminal clusters, corolla salverform, white with yellow throat, 3 cm. or more wide, aromatic; fruit oval or elliptical, large, smooth, black when ripe.

Tongatapu: *Moseley;* in thicket along strand below Navutoka village, Feb. 27, 1953, *Yuncker 15106.*

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[1] /Ochrosia oppositifolia -- Analyst/

Flowers one to three on a long, axillary peduncle, calyx lobes with an awl-like tip up to 1 cm. or more long, corolla tubular with broadly spreading limb, up to 10 cm. or more long, white. 137

Tongatapu: in roadside thicket near Nuku'alofa, 1926, *Setchell and Parks 15610.*

Vava'u: climbing in thicket near shore of lagoon at Vaihoi, May 26, 1953, *Yuncker 16193.*

Infrequent. A tropical American species now widely distributed in warm countries.

I. bona-nox L. in Hemsley's and Burkill's lists.

Ipomoea batatas (Linnaeus) Poiret, in Lamarck, Encycl. Méth. 6: 14, 1804.

Smooth, creeping, herbaceous vine, forming large, edible, root tubers. Leaves alternate, deltoid-ovate, variously lobed but commonly with two prominent basal lobes, acute, petiole slender and longer than blade. Flowers purplish red.

The tubers represent an important item in the diet of the Tongans and are cultivated throughout Tonga. A South American species now pantropic in distribution. 824 262 244

Tongan name: *kumala*. The following varieties are distinguished:

Fa'afonua: stem and leaves are pubescent; flesh of tuber, firm and pink.
Finau: leaves are large, light green; tuber often nodose, white.
Kumala 'eua: leaves are large; tuber, white but purplish toward center.
Kumala kula: stem is greenish red; skin of tuber, red.
Kumala lesi: stem is greenish red; skin of tuber, red.
Kumala vai: stem is green; skin of tuber, pink.
Lokoloka: leaves are large, thin, round; skin of tuber, pale, flesh purplish.
Mosese hina: stem is light green; leaves, large; skin of tuber, pale.
Mosese kula: leaves are large, round, purplish; skin of tuber, pale.
Palatea.
Silika: stem is dark green; skin of tuber, pink.
Tai: skin of tuber, pale.
Teiko: young leaves are purplish; skin of tuber, yellowish.
Tongamai: stem is light green; skin of tuber, pale.

Ipomoea cairica (Linnaeus) Sweet, Hort. Brit., 287, 1827.

Glabrous, slender, twining, branched vine. Leaves broadly ovate in outline, 6 cm. or more long and about as wide, five- to seven-divided, divisions elliptic-lanceolate, acuminate, petioles slender, as long as blade. Flowers narrowly campanulate, 5-6 cm. long, corolla deep lavender, paler outside. 137

Tongatapu: climbing over shrubbery in low, waste area near Nuku'alofa, Mar. 7, 1953, *Yuncker 15201.*

Vava'u: in roadside thicket between villages of Faletoa and Leimatua, Mar. 20, 1953, *Yuncker 16054.*

Occasional as an escape from cultivation. A tropical Asiatic species now widely distributed.

Tongan name: *maile nuiniti.*

137 cm. wide, densely silvery hairy. Flowers small, very numerous, white, sessile, in large, branching, long-pedunculate, scorpioid-cymose clusters; fruit round, four-parted, about 7 mm. in diameter.

Tongatapu: *Forster;* seaward margin of coastal forest fringe, below village of Niutoua on eastern side of island, Mar. 2, 1953, *Yuncker 15130.*

'Eua: *Lister;* along outer margin of seaside thicket, Lokupo, on northeastern side of island, Mar. 27, 1953, *Yuncker 15538.*

Lifuka: in thicket just above upper tidal limit along beach north of Pangai village, Apr. 24, 1953, *Yuncker 15712.*

Vava'u: *Crosby.*

Rather frequent near shore throughout Tonga. From tropical Asia through Malaysia to Australia and Polynesia.

Tournefortia argentea L. f. in Hemsley's list.

Tongan name: *touhuni.*

FAMILY VERBENACEAE

Identifications of the Verbenaceae are by H. N. Moldenke.

Genus **Lantana** Linnaeus

Lantana camara Linnaeus var. **aculeata** (Linnaeus) Moldenke, Torreya 34:9, 1934.

Scabrous-pubescent shrub, up to 4 m. or more tall, armed with short, recurved prickles. Leaves simple, opposite, ovate, acute at both ends, up to 7 cm. or more long and 4-5 cm. wide, pinnately nerved, crenate, petioles about 1 cm. long. Flowers 5-7 mm. long, several, in compact, headlike clusters, on axillary peduncles up to about as long as leaves, corolla tubular, yellow or orange, turning purplish.

Tongatapu: in thicket near shore, about 2 km. west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15002.*

'Eua: in thicket near center of island, Mar. 22, 1953, *Yuncker 15426.*

Occasional. A tropical American species now pantropic in distribution, especially this thorny variety.

Tongan name: *talatala.*

[824] [245] The brush is sometimes used to support yam vines.

Genus **Stachytarpheta** Vahl

Stachytarpheta urticaefolia (Salisbury) Sims, Curtis's Bot. Mag. 43: pl. 1848, 1816.

Subherbaceous plant up to about 1 m. tall, widely branching. Leaves opposite, oval-ovate, acute, base cuneate-decurrent, serrate, up to 8 cm. or more long and 4 cm. wide, pinnately nerved, smooth or slightly hairy, petioles winged by blade margins. Flowers numerous, sessile, in groove-like depressions in a spike-like rachis up to 50 cm. or more long, corolla deep blue, opening successively from base upward and quickly deciduous.

Tongatapu: in sandy soil near beach below Navutoka village, Feb. 27, 1953, *Yuncker 15105.* 137

A common roadside and waste-area weed throughout Tonga. Widespread in tropical countries.

Tongan name: *iku'ikuma.*

Genus **Duranta** Linnaeus

Duranta repens Linnaeus, Sp. Pl., 637, 1753.

Shrub up to 4 m. or more tall, twigs sparsely hairy, sometimes spiny. Leaves opposite or in whorls, oval, acute at both ends, 5-8 cm. or more long and 2 cm. wide, obscurely toothed above middle. Flowers tubular, about 8 mm. long, blue, on short pedicels, in axillary and terminal paniculate clusters; fruit about 6 mm. long, orange.

'Eua: in margin of forest on terrace above village of Houma, Mar. 26, 1953, *Yuncker 15499.* This specimen obviously an escape.

Infrequently cultivated ornamental in Tonga. A tropical American species widely cultivated in warm countries as an ornamental. [824] [245]

Tongan name: *'olive.*

Genus **Premna** Linnaeus

Premna obtusifolia R. Brown, Prodr. Fl. Nov. Hollandiae, 512, 1810.

Shrub or dwarf tree, the young growth puberulent. Leaves opposite, oblong-ovate, obtuse or abruptly acute, base obtuse or cordulate, up to 8 cm. long and 5 cm. wide, crenate-serrate, petiole mostly less than 1 cm. long. Flowers small, greenish, in terminal, branching clusters; fruit globose, about 3 mm. in diameter.

'Eua: on western slope of eastern ridge in dry, open areas, Mar. 24, 1953, *Yuncker 15438.*

Occasional. Malaya, Philippines, tropical Australia to Polynesia.

Tongan name: *volovalo.*

Premna taitensis Schauer var. **rimatarensis** F. B. H. Brown, B. P. Bishop Mus., Bull. 130: 248, 1935.

Shrub or small tree up to 5 m. or more tall, stems nearly glabrous. Leaves opposite, ovate, acute or obtuse, base obtuse or cordate, up to 10 cm. long and 6 cm. wide, glabrous or nearly so above, subglabrous below except woolly vein axils, petioles 2-3 cm. long. Flowers small, greenish white, in terminal, puberulent panicles; fruit globose, about 6 mm. in diameter.

Tongatapu: in swampy area between Navutoka village and sea, Feb. 27, 1953, *Yuncker 15076.*

'Eua: *Lister;* in thin forest along trail to summit of eastern ridge above Fuai, Mar. 20, 1953, *Yuncker 15376.*

Nomuka: in thicket on lake side of road encircling island, Apr. 30, 1953, *Yuncker 15850.*

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137 **Lifuka**: in thicket near sea north of Pangai village, Apr. 25, 1953, *Yuncker 15741.*

Kao: in open forest near old plantation on lower slope, May 6, 1953, *Yuncker 15970.*

Vava'u: *Crosby; Harvey;* along upper edge of coastal limestone cliff above Leimatua, May 25, 1953, *Yuncker 16079.*

Frequent in thickets throughout Tonga. Fiji eastward to the Marquesas.

All of the material collected is referable to this variety and it is believed to be the same plant listed by Hemsley and Burkill as *P. taitensis* Schau.

Tongan name: *volovalo.*

[824] [278] The leaves[1] are used in preparing medicines.

Genus **Vitex** Linnaeus

Vitex trifolia Linnaeus var. **bicolor** (Willdenow) Moldenke, Known Geogr. Distrib. Verb., 79, 1942.

Shrub or small tree up to 3 m. tall, twigs densely tomentose. Leaves opposite, mostly palmately five-compound, leaflets elliptic-lanceolate, acuminate, base acute, lateral leaflets smaller than terminal one, up to 10 cm. long and 3 cm. wide, pinnately nerved, dark above, lower surface densely white-tomentose. Flowers about 5 mm. long, lilac or lavender, short-pedicellate, in large, branching, axillary or terminal, tomentose, paniculate clusters.

Tongatapu: *Forster; Moseley;* in thicket near sea, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15011.*

Nomuka: in thicket on seaward side of road encircling island, Apr. 30, 1953, *Yuncker 15801.*

Vava'u: *Crosby.*

Occasional throughout Tonga. From eastern Africa and India through Malaysia to Polynesia.

Presumably the *V. trifolia* L. of Hemsley's and Burkill's lists.

Genus **Faradaya** F. v. Mueller

Faradaya amicorum (Seemann) Seemann, Jour. Bot. **3**: 258, 1865.

Woody, vinelike shrub climbing in trees. Leaves simple, opposite, ovate or elliptic-obovate, abruptly short-acuminate, base acute, up to 25 cm. or more long and 15 cm. wide, pinnately nerved, petiole 3-4 cm. long. Flowers large, white, showy, in terminal panicles, corolla long-tubular, with four-parted limb; fruit up to four, one-seeded, woody nutlets.

Tongatapu: *Banks and Solander;* in forest below Nualei, climbing in tree, Mar. 9, 1953, *Yuncker 15242.*

'Eua: *Lister;* climbing in tree, edge of forest near the center of the island, Mar. 19, 1953, *Yuncker 15368.*

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[1] /Premna taitensis -- Analyst/

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Nomuka: margin of thicket along road encircling island between sea and inland lake, Apr. 30, 1953, *Yuncker 15816.*

Lifuka: roadside ditch between Pangai village and southern end of island, Apr. 28, 1953, *Yuncker 15780.*

Vava'u: along road between Mataika and Feletoa, northwest of Neiafu, May 20, 1953, *Yuncker 16053.*

Occasional as a plantation and waste-area weed throughout Tonga. A tropical American plant now widespread in warm countries.

Tongan name: *te'ekosi totolo.*

Salvia coccinea Jussieu, Murray, Soc. Reg. Sci. Gott. Comm. 1: 86, 1778.

Freely branching, hairy herb, up to about 60 cm. tall. Leaves ovate, acute or obtuse, base truncate or subcordate, up to 5 cm. or more long, crenate-serrate, petioles rather slender. Flowers bright red or pink, corolla puberulent, about twice as long as calyx.

Vava'u: *Crosby.*

A tropical American species rather widespread as a weed in waste areas.

S. pseudo-coccinea Jacq. in Burkill's list.

Tongan name: *te'ekosi.*

Genus **Coleus** Loureiro

Coleus amboinicus Loureiro, Fl. Cochinchinensis, 372, 1790.

Low, densely pubescent, aromatic herb. Leaves opposite, ovate, acute or obtusish, base cuneate, up to 12 cm. or more long and 9 cm. wide, coarsely toothed, finely pubescent on both sides, petiole up to 5 cm. or more long. Flowers pale lavender, on short, slender pedicels, in whorls in a terminal, interrupted, racemose cluster.

Tongatapu: garden, Nuku'alofa, 1926, *Setchell and Parks 15414;* in border of plantation near Nualei village, Mar. 9, 1953, *Yuncker 15232.*

Nomuka: sandy soil near sea below village, Apr. 30, 1953, *Yuncker 15861.*

Lifuka: roadside north of Pangai village, May 10, 1953, *Yuncker 15797.*

Frequent as a waste-area and roadside weed throughout Tonga. From India and Malaya to Polynesia.

Tongan names: *pasiole, kaloni.*

The plants are extremely aromatic. The leaves are added to the water for washing clothes to perfume them and are used for scenting oil. 824 296 303

Coleus blumei Bentham, Labiat. Gen. and Sp., 56, 1832.

Erect, tender, square-stemmed, brown-pubescent herb, up to about 1 m. tall. Leaves opposite, ovate, crenate, up to 15 cm. long, acute, often dark red above, red and green beneath, petioles long and slender. Flowers light blue, subsessile, in whorls on an elongated terminal spike.

Frequent as an ornamental about dwellings, in cemeteries, and so forth. Occasional specimens were noted as escapes along roadsides. An East Indian species now of worldwide cultivation. 824 245 351 764

Genus **Ocimum** Linnaeus

137 **Ocimum basilicum** Linnaeus, Sp. Pl., 597, 1753.

Free branching, square-stemmed, pubescent, aromatic herb, up to 60 cm. or more tall. Leaves opposite, oval-ovate, acute at both ends, up to 3 cm. or more long, finely toothed, minutely dotted, petiole slender. Flowers short-pedicellate, nodding, in interrupted, terminal spikes, calyx bilabiate, purplish, membranous, veiny, with suborbicular, acute upper lip and aristate lower lip, corolla white or essentially so; fruit of four dry nutlets, which become mucilaginous when wet.

Tongatapu: *Home.*
'Eua: *Lister.*
Vava'u: *Crosby.*
From tropical Asia to Polynesia.

Ocimum gratissimum Linnaeus, Sp. Pl., 1197, 1753.

Sub-shrubby, up to 3 m. or more tall. Leaves ovate-elliptical, pointed at both ends, up to 10 cm. long and 4 cm. wide, coarsely crenate-serrate, usually pubescent, petioles up to 5 cm. long. Flowers closely verticillate, on slender pedicels up to 3 mm. or more long, in spicate clusters up to 15 cm. long.

Tongatapu: *Moseley.*
Introduced. Tropical Africa, Ceylon, and the East Indies.

FAMILY SOLANACEAE

Genus **Physalis** Linnaeus

Physalis angulata Linnaeus, Sp. Pl., 183, 1753.

Erect, glabrous, branching herb with angular stems, up to 80 cm. or more tall. Leaves alternate, elliptic-ovate, acuminate, base ovate, irregularly toothed or entire, up to 8 cm. or more long and 4-5 cm. wide. Flowers on slender, axillary pedicels about 1 cm. long, 5-6 cm. long, corolla yellow, fruit fleshy, about 1 cm. in diameter, enclosed by inflated, ovoid calyx, up to about 3 cm. long.

Tongatapu: weed in plantation near village of Lavutoka, Feb. 27, 1953, *Yuncker 15098.*

An occasional plantation weed. A tropical American species now of wide distribution as a weed in warm countries.

Tongan name: ***polo pa.***

The leaves are used in preparing medicines.

[824]
[278] **Physalis minima** Linnaeus, Sp. Pl., 183, 1753.

Low, much-branched, somewhat sprawling herb. Leaves mostly alternate, oval-ovate, acute at both ends, up to about 6 cm. long and 3 cm. wide, margin entire or somewhat wavy, petioles slender, nearly as long as leaves. Flowers solitary, axillary, corolla yellow with a darker center; fruit berrylike, enclosed in papery, inflated, baglike calyx.

'Eua: weed in margin of old plantation, along trail between Pangai village and Fuai, Mar. 25, 1953, *Yuncker 15463.*

Vava'u: *Crosby.*

Occasional as a plantation weed. Pantropic.

Tongan name: *polo pa.*

Physalis peruviana Linnaeus, Sp. Pl., ed. 2, 1670, 1763.

Widely branching, pubescent herb, up to 50 cm. or more tall. Leaves alternate, ovate, apex acuminate, base rounded or cordate, irregularly sinuate-toothed, up to 12 cm. or more long and 9 cm. wide, petioles up to 4 cm. long. Flowers solitary, axillary, pedicels slender, 1-2 cm. long, corolla yellow with a brownish-purple center; berry yellow, many-seeded, enclosed in a veiny, inflated, parchmentlike case about 3 cm. in diameter.

Tongatapu: *Moseley;* in plantation near Navutoka village, Feb. 27, 1953, *Yuncker 15087.*

Vava'u: *Crosby.*

Occasional as a plantation weed. A South American plant now widely distributed in warm countries as a weed.

Tongan name: *ku'usi.*

The leaves are used in preparing medicines.

[824]
[278]

Genus **Capsicum** Linnaeus

Capsicum frutescens Linnaeus, Sp. Pl., 189, 1753.

Strongly branched, sub-shrubby plant, up to about 1.5 m. tall. Leaves alternate, ovate-lanceolate, acuminate, base acute, entire or slightly undulate, smooth or slightly pubescent, petioles mostly 1-2 cm. long. Flowers small, white, solitary or paired, axillary, pedicels about 2 cm. long; fruit erect, ovoid, about 2.5 cm. long, bright red when ripe, very pungent when eaten.

Tongatapu: *Moseley;* in waste area near Hufangalupe, Feb. 26, 1953, *Yuncker 15037.*

'Eua: *Lister;* in a small clearing in forest near center of island, Mar. 19, 1953, *Yuncker 15354.*

Vava'u: *Crosby.*

Occasional throughout Tonga. A tropical American species now pantropic.

Tongan names: *polo, polo fifisi.*

The fruit is used as a food flavoring.

[824]
[263]

Genus **Solanum** Linnaeus

Solanum amicorum Bentham, Hook. London, Jour. Bot. 2:227, 1843.

Shrub, the branches sulcate. Leaves ovate, obscurely angular-sinuate, glabrate above, reticulate-veiny beneath; nerves, petiole and raceme branches rough-tomentose. Racemes lateral, many-flowered, calyx five-toothed, corolla deeply five-parted, lobes lanceolate, acute.

Tongatapu: *Forster; Nelson.*

Vava'u: *Barclay; Crosby.*

No specimens of this or of the following species were found. They are included on the basis of Hemsley's and Burkill's reports. Pacific Islands.

137**Solanum forsteri** Seemann, Jour. Bot. 1: 207, 1863.

Herbaceous, hairy glabrescent annual plant. Leaves ovate, acuminate, entire or sinuate-dentate, base cordate or attenuate into petiole. Cymes three- to six-flowered, calyx lobes ovate, acute, corolla puberulent without; berry globose, smooth.

Vava'u: *Barclay; Crosby.*

Easter Island, Tahiti.

Solanum nigrum Linnaeus, Sp. Pl., 186, 1753.

Glabrous or slightly pubescent, widely branching herb, up to about 80 cm. tall. Leaves alternate, elliptic-ovate, acute at both ends, entire or somewhat sinuate, petioles mostly 1-2 cm. long. Flowers small, white, in long-stalked, axillary, umbellate clusters; fruit small, fleshy, globose, black when ripe.

Tongatapu: weed in plantation below village of Ha'akame, Mar. 12, 1953, *Yuncker 15272.*

Frequent throughout Tonga as a plantation weed. A European species now widely distributed as a weed in temperate and tropical countries.

S. oleraceum Dunal in Hemsley's list.

Tongan name: *polo kai.*

Solanum uporo Dunal, in DC. Prodr. 13: 138, 1852.

Sub-shrubby herbaceous plant, up to 2 m. or more tall, stems glabrous or nearly so. Leaves elliptic or ovate, acuminate, base acute to cuneate, up to 15 cm. or more long and 8 cm. wide, entire or slightly sinuate, petioles up to 3 cm. long. Flowers in branching, axillary clusters, corolla yellowish white, about 1 cm. wide, stellate-pubescent on outside; fruit up to 2 cm. or more in diameter, ovoid or subglobose, fleshy, bright red.

Tongatapu: in thicket near sea on eastern side of island near Niutoua village, Mar. 2, 1953, *Yuncker 15131.*

'Eua: *Lister;* in thicket along road between Mua and Ha'aluma, Apr. 1, 1953, *Yuncker 15584.*

Vava'u: *Barclay.*

Occasional. Tahiti, Rarotonga.

Tongan name: *polo tonga.*

824 The leaves are used in the preparation of medicines.

278 **Solanum verbascifolium** Linnaeus var. **auriculatum** (Aiton) Kuntze, Rev. Gen. Pl. 1: 455, 1891.

Small, densely pale-pubescent tree, up to 8 m. tall. Leaves alternate, elliptic-lanceolate, acuminate, base acute, pinnately nerved, nerves conspicuous and submarginally loop-connected, up to 30 cm. long and 9 cm. wide, petiole 2-5 cm. long, with large, auriculate, stipule-like bracts at the base. Flowers about 2 cm. wide, in dense, many-flowered, long-pedunculate terminal, paniculate clusters, corolla lavender.

Tongatapu: in thicket near Vaini village, Feb. 26, 1953, *Yuncker 15043.*

'Eua: *Parks 16086;* open margin of forest above Fuai plantation near center of island, Mar. 18, 1953, *Yuncker 15325.*

Nomuka: in thicket along road encircling island, Apr. 30, 1953, *Yuncker 15818.*

Genus **Datura** Linnaeus

137 **Datura stramonium** Linnaeus, Sp. Pl., 179, 1753.

Coarse, hollow-stemmed, weedy plant, divaricately branched, up to 1.5 m. tall. Leaves ovate, acute at both ends, alternate, up to 20 cm. long, coarsely toothed, petiole rather long. Flowers 8-10 cm. long, corolla white or pale violet, funnelform, gradually widening upward; capsule ovoid, up to 5 cm. long, spiny.

Vava'u: *Crosby.*

Infrequent. An Asiatic species of worldwide distribution as a weed in temperate and tropical countries.

Genus **Cestrum** Linnaeus

Cestrum diurnum Linnaeus, Sp. Pl., 191, 1753.

Shrub, up to 3 or 4 m. tall. Leaves alternate, elliptic-oblong, acute at both ends, up to 10 cm. long and 3 cm. wide, glabrous, petiole about 1 cm. long. Flowers about 1.5 cm. long, glabrous, in cymose clusters on axillary peduncles up to 5 cm. or more long, very fragrant, calyx tube obscurely toothed, corolla lobes short, blunt, recurved; berry ellipsoidal to subspherical, about 1 cm. long, purple black when ripe.

Lifuka: in thicket, edge of plantation along road north of Pangai village, Apr. 24, 1953, *Yuncker 15710.*

Vava'u: along street leading to wharf in Neiafu, May 22, 1953, *Yuncker 16138.*

[824] [245] Cultivated as an ornamental and occasional as an escape. A West Indian species, now widely planted as an ornamental in warm countries.

Tongan name: *vaitohi.*

Genus **Nicotiana** Linnaeus

Nicotiana fragrans Hooker, Bot. Mag. 81: pl. 4865, 1855, var. **fragrans.**

Low plant with short, prostrate, woody stems up to 1 cm. thick. Leaves clustered at ends of stems, obovate-spatulate, apex rounded, base cuneate-decurrent, up to 10 cm. or more long and 4 cm. wide, pubescent, petiole winged by decurrent leaf-blades. Flowers white, on erect stalks up to 30 cm. tall.

Tongatapu: in soil pockets on perpendicular face of seaside cliff, Fangaveha, on southern coast of island, June 7, 1953, *Yuncker 16252.* (Identified by T. H. Goodspeed.)

Very rare in Tonga. Known also from the Isle of Pines, New Caledonia, and from Lifu in the Loyalties.

Nicotiana tabacum Linnaeus, Sp. Pl., 180, 1753.

Erect, glandular-pubescent herb, up to 1 m. or more tall. Leaves alternate, oval, obtuse to acuminate, base rounded, clasping the stem. Flowers mostly 3-5 cm. long, glandular-pubescent, in terminal, paniculate clusters, corolla tubular, pink or red; capsules many-seeded.

Tongatapu: near dwelling in Nualei village, Mar. 9, 1953, *Yuncker 15235.* 137

Occasional about dwellings and in plantations. A tropical American plant,[1] now widely planted for its use as tobacco.

Tongan name: *tapaka.*

The tomato (*Lycopersicon esculentum* Miller), the potato (*Solanum tuberosum* 824
Linnaeus). and the eggplant (*S. melongena* Linnaeus var. *esculentum* 244
Nees) are cultivated to some extent as food crops. Many varieties of petunia 262
(*Petunia hybrida* Vilmorin) are grown for ornament. 247

FAMILY SCROPHULARIACEAE

Genus **Lindernia** Allioni

Lindernia crustacea (Linnaeus) F. Mueller, Census, 97, 1882.

Small, much-branched herb, 10-20 cm. tall, stems angled and slightly winged along ridges. Leaves opposite, ovate, acute at both ends, serrate, up to about 1 cm. long, sparsely pubescent, petiole very short. Flowers 5-8 mm. long, pale lavender, solitary on rather long, slender, axillary pedicels; capsule obovate-elliptical, compressed, about 3 mm. wide.

Kao: on thin rocky soil in open alpine area, alt. 600-700 m., May 6, 1953, *Yuncker 15925, 15930.*

Vava'u: *Crosby.*

Infrequent. A native of the Old World tropics; now of wide distribution in warm climates of both hemispheres.

Genus **Russelia** Jacquin

Russelia equisetiformis Schlechtendal and Chamisso, Linnaea 6: 377, 1831.

Semi-shrubby plant, up to about 1 m. tall, with longitudinally ridged, green stems, and numerous verticillately arranged, drooping branches. Leaves very small, linear or awl-shaped, whorled. Flowers about 2.5 cm. long, in lax, terminal clusters, corolla tubular, red.

Occasional in villages. A Mexican species, now widely cultivated in warm countries as an ornamental.

FAMILY BIGNONIACEAE

Genus **Stenolobium** D. Don

Stenolobium stans (Linnaeus) D. Don, Edinb. Philos. Jour. 9: 88, 1823.

Large shrub, about 4 m. tall. Leaves opposite, pinnate, leaflets five to 13, narrowly elliptic, up to 10 cm. or more long and 3 cm. wide, serrate, acuminate, base cuneate, sessile, pinnately nerved. Flowers in large, terminal, paniculate clusters, corolla up to 5 cm. long, yellow, narrowly bell-shaped, ornamental; fruit narrow, up to about 10 cm. long.

Tongatapu: near dwelling in Nuku'alofa, Mar. 7, 1953, *Yuncker 15200.*

An American species, now widely planted as an ornamental in warm countries.

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[1] /Nicotiana tabacum -- Analyst/

137 Tongatapu: *Forster;* in thicket below Nualei village, Mar. 9, 1953, *Yuncker 15238.*

'Eua: *Lister;* in open forest near center of island, Mar. 18, 1953, *Yuncker 15328;* in forest along trail to "Smoky Hole" above Fuai, Mar. 31, 1953, *Yuncker 15573.*

Lifuka: in thicket along road near south end of island, Apr. 28, 1953, *Yuncker 15781.*

Kao: in lower forest margin, May 6, 1953, *Yuncker 15963.*

Vava'u: *Crosby;* in thicket along summit of seaside cliff below village of Houma, May 22, 1953, *Yuncker 16120.*

Niuafo'ou: in thicket a short distance above upper limit of recent lava flows, May 16, 1953, *Yuncker 15997.*

Frequent throughout Tonga. Micronesia and New Caledonia eastward to Tuamotu Islands.

[824] Tongan names: *manonu, takafalu.*

[278] The bark[1] is used in the preparation of medicines.

Genus Randia Linnaeus

Randia cochinchinensis (Loureiro) Merrill, Am. Philos. Soc., Trans. 24(2): 365, 1935.

Glabrous shrub, 1-2 m. tall. Leaves opposite, elliptic or elliptic-ovate, acute, base acute-decurrent, up to 15 cm. long and 6 cm. wide, pinnately nerved, petiole ridged by decurrent blade margins, about 1 cm. long, stipules small, connate. Flowers white, in branching, axillary clusters up to 4-5 cm. or more long; fruit red, obovoid, 5-8 mm. long, crowned by calyx.

Tongatapu: *Moseley.*

Vava'u: *Harvey; Barclay; Crosby;* in thicket on upper rim of seaside cliff above Ha'alaufuli, May 21, 1953, *Yuncker 16098;* along trail leading to summit of Talau, west of Neiafu, May 23, 1953, *Yuncker 16143.*

Occasional. Tropical Asia, Malaysia, Micronesia, and Polynesia.

R. coffeoides Benth. and Hook. in Hemsley's and Burkill's lists.

Randia crosbyi Burkill, Linn. Soc. Bot., Jour. 35: 41, 1901.

Small tree, up to 4 m. or more tall. Leaves opposite, elliptic or oblong-elliptic, acute or short-acuminate, base oblique, obtuse or acutish, glabrous, entire, up to 15-18 cm. long and 6 cm. wide, pinnately nerved, petiole up to 1 cm. long. Flowers few, small, on slender pedicels up to 1-1.5 cm. long, in small, axillary clusters; fruit globose, about 1 cm. in diameter, crowned by pubescent calyx.

Vava'u: *Crosby 76;* in thicket along upper rim of seaside cliff on northwestern side of island, May 25, 1953, *Yuncker 16172.*

Infrequent. Endemic.

[1] /Tarenna sambucina -- Analyst/

Genus Gardenia Ellis

Gardenia jasminoides Ellis, Roy. Soc. Philos., Trans. 51(2): 935, 1761. 137

Shrub, 1-2 m. or more tall. Leaves opposite, elliptic-obovate, bluntly short-pointed, base cuneate, up to 5 cm. or more long and 2.5 cm. wide, somewhat glossy, petiole very short, winged by decurrent blade margins. Flowers large, fragrant, solitary in the leaf axils, calyx angled or winged, corolla white, turning yellowish, tube about 5 cm. long; fruit ovoid, many-seeded.

Tongatapu: near dwelling in Fatai village, Mar. 10, 1953, *Yuncker 15257*.

Occasional as an ornamental shrub. A native of China now widely cultivated.

Tongan name: *siale matalateau*.

The flowers are used in leis.

[824]
[301]

Gardenia taitensis de Candolle, in DC. Prodr. 4: 380, 1830.

Large shrub or small tree up to 4 m. or more tall. Leaves opposite, elliptic-obovate, obtusely short-pointed, base acute to cuneate, up to 13 cm. long and 7 cm. wide, pinnately nerved, petiole very short, winged by decurrent blade margins. Flowers white, very fragrant, corolla lobes about 4 cm. long, spreading, equaling tube, solitary, axillary; fruit globose, about 2.5 cm. in diameter, longitudinally ridged.

Tongatapu: *Forster; Graeffe;* in thicket along trail between village of Ha'akame and sea, Mar. 12, 1953, *Yuncker 15281*.

'Eua: *Lister;* in Pangai village, Mar. 25, 1953, *Yuncker 15480*.

Rather frequent in villages and occasionally in thickets. Polynesia and Fiji.

Tongan name: *siale tonga*.

The flowers are used for leis, the scenting of oil, and so on.

[824]
[301]
[303]

Genus Canthium Lamarck

Canthium barbatum (Forster f.) Seemann, Fl. Vit., 132, figs. 2, 3, 1866.

Glabrous shrub or small tree, up to 5 m. tall. Leaves opposite, oval, oblong-oval-ovate, or oval-subobovate, abruptly short-acuminate, base acute, decurrent, up to 15 cm. long and 9 cm. wide, but mostly smaller, pinnately nerved, petiole scarcely up to 1 cm. long. Flowers about 8 mm. long, corolla tube narrow, limb spreading to about 5 mm. in width, white turning yellow, on pedicels 1-1.5 cm. long, in few-flowered, umbel-like or paniculate clusters on axillary, peduncle-like stalks about 2 mm. or more long; fruit obcordate, compressed, about 1 cm. long and as wide, red.

Tongatapu: *Forster;* in thicket near Vaini village, Feb. 26, 1953, *Yuncker 15045;* in forest near Niutoua village, Mar. 2, 1953, *Yuncker 15128;* in seaside thicket, Blow Hole area near Houma village, June 1, 1953, *Yuncker 16221;* in seaside thicket below Haveluliku village, June 3, 1953, *Yuncker 16232*.

'Eua: *Lister;* seaward margin of ridge forest above village of Houma, Mar. 26, 1953, *Yuncker 15492;* in seaward margin of forest on terrace on northwestern side of island, Mar. 26, 1953, *Yuncker 15504*.

Nomuka: in thicket near shore of central lake, Apr. 30, 1953, *Yuncker 15843*.

'Eua: *Lister.*

Lifuka: in seaside thicket north of Pangai village, Apr. 25, 1953, *Yuncker 15747;* in seaside thicket near southern end of island, Apr. 28, 1953, *Yuncker 15790.* 137

Kao: on lower rocky slope in clearing, May 6, 1953, *Yuncker 15878.*

Vava'u: *Crosby; Harvey.*

Niuafo'ou: near shore of central crater lake, May 16, 1953, *Yuncker 16011.*

Common near the shore throughout Tonga. An Indo-Malaysian strand species extending into Polynesia.

Tongan name: *puopua.*

The wood[1] is used for general construction work, banana shooks, and so forth; the bark, in preparing medicines; and the flowers, to perfume oils. [824] [313] [278] [303]

Genus Timonius de Candolle

Timonius polygamus (Forster f.) Robinson, Am. Acad. Arts Sci., Proc. 45: 394, 1910.

Shrub, about 2 m. or more tall. Leaves opposite, obovate, apex rounded, obtuse or slightly pointed, base acute or obtusish, rather thick, glossy above, up to 10 cm. or more long and 5 cm. wide, pinnately nerved, petiole scarcely 5 mm. long. Flowers white, pubescent, solitary or several in cymose clusters on rather long, axillary peduncles; fruit subglobose, about 1 cm. long, crowned with calyx.

Vava'u: *Crosby;* along upper edge of limestone coastal cliff above Leimatua, May 25, 1953, *Yuncker 16075.*

Occasional. Eastern Fiji to the Tuamotus and Henderson Island.

T. forsteri DC. in Burkill's list.

Genus Coffea Linnaeus

Coffea arabica Linnaeus, Sp. Pl., 172, 1753.

Shrub or small tree, about 2-3 m. tall. Leaves opposite, oblong-elliptic to subobovate, glossy, acuminate, base acute, glabrous, pinnately nerved, petiole about 1 cm. long. Flowers white, fragrant, short-pedicellate, in axillary clusters; fruit ovoid, red, two-seeded.

Tongatapu: in plantation below Nualei village, Mar. 9, 1953, *Yuncker 15226.*

Occasional in villages or plantations. A tropical African species now widely grown in tropical countries.

Tongan name: *kofi.*

Genus Ixora Linnaeus

Ixora calcicola A. C. Smith, sp. nov. (fig. 13).

Frutex ad 1.5 m. altus, ramulis glabris teretibus rugulosis cinereis apices versus circiter 2 mm. diametro; stipulis libreis glabris circiter 4 mm. longis e basi late ovato in aristam rigidam ad 2 mm. longam angustatis, pilis supra cicatricibus castaneis circiter 1 mm. longis; foliis glabris, petiolis semiteretibus rugulosis 3-6 mm. longis, laminis papyraceis

[1] /Guettarda speciosa -- An lyst/

137 *Psychotria macrocalyx* A. Gray (type from Tongatapu, *U. S. Expl. Exped.*, U.S. Nat. Herb. no. 52345) has leaves as small as those of the new species but acuminate and with more sharply ascending secondaries; its fruit has an erect and obviously dentate calyx limb nearly 5 mm. long, and its stipule lobes are very narrow, these characters readily distinguishing it from our species.

Psychotria macrocalyx A. Gray, Am. Acad. Arts Sci., Proc. 4: 46, 1860.

Glabrous shrub, the branches slender. Leaves lanceolate or oblong-lanceolate, up to 8 cm. long and 3.5 cm. wide, acuminate, base narrowed to petiole, rather papery, stipular lobes narrow. Flowers in terminal clusters.

Tongatapu: *U. S. Expl. Exped.* Endemic.

Genus **Carinta** Safford

Carinta herbacea (Jacquin) W. F. Wight, ex Safford, U.S. Nat. Herb., Contrib. 9: 216, 1905.

Small, glabrous herb with slender, creeping stems rooting at the nodes. Leaves opposite, rounded, deeply cordate, about 2.5 cm. wide, palmately nerved, entire, the petioles commonly about as long as the blade. Flowers small, white, in few-flowered, axillary, pedunculate umbels; the fruit fleshy, red.

'Eua: *Lister;* on moist forest floor in broken sunlight, near center of island, Mar. 18, 1953, *Yuncker 15317*.

Vava'u: *Crosby*.

Occasional in moist forested areas. Pantropic.

Geophila reniformis D. Don in Hemsley's and Burkill's lists.

Tongan name: *tono*.

[824] [278] The leaves are used in medicines.

Genus **Gynochthodes** Blume

Gynochthodes ovalifolia (Valeton) Kanehira var. **smithii** Fosberg, Torrey Bot. Club, Bull. 67: 421, 1940.

Vigorous, glabrous, woody vine. Leaves opposite, oval-ovate, acuminate, base acute, entire, up to 8 cm. or more long and 6 cm. wide, pinnately nerved, petioles 1-3 cm. long, slightly ridged by decurrent blade margins.

'Eua: climbing in thicket, margin of forest on seaward terrace of coastal cliff on way down to Lokupo, Mar. 27, 1953, *Yuncker 15520*.

Apparently very infrequent. Also in Fiji and Samoa.

Genus **Morinda** Linnaeus

Morinda citrifolia Linnaeus, Sp. Pl., 176, 1753.

Shrub or small tree with four-sided, glabrous branches. Leaves opposite, broadly oval or slightly obovate, pubescent when young, acute at both ends, up to 30 cm. long and 15

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cm. wide, petioles 1-2 cm. long, narrowly ridged by decurrent blade margins, stipules connate. Flowers white, in a globose, fleshy, headlike, pedunculate, axillary cluster; fruit globose-ovoid, about the size of an egg, fleshy and yellowish white when mature. 137

Tongatapu: *Forster;* in thicket near Vaini village, Feb. 26, 1953, *Yuncker 15037, 15038.*

'Eua: *Lister;* in open forest near center of island, Mar. 19, 1953, *Yuncker 15367.*

Lifuka: clearing near east side of island, along cross-island road between Pangai and eastern coast, Apr. 27, 1953, *Yuncker 15756.*

Vava'u: *Crosby;* along trail to summit of Talau, west of Neiafu, May 23, 1953, *Yuncker 16146.*

Common in thickets at lower altitudes throughout Tonga. From India through Malaya to Polynesia.

Tongan name: *nonu.*

The roots[1] furnish a dye; the leaves are used as a remedy for boils; and various parts of the plant are used in medicines. 824 386

Morinda umbellata Linnaeus var. **forsteri** (Seemann) Fosberg, in Smith, Sargentia: 1: 123, 1942. 757 278

Stout, woody vine. Leaves opposite, elliptic, acute to acuminate, base acute, up to 8 cm. or more long and 4 cm. wide, somewhat coriaceous, pinnately nerved, lateral nerves submarginally loop-connected, petiole 1-1.5 cm. long, narrowly laterally ridged by the decurrent blade margins. Flowers white, in a fleshy, pedunculate, axillary, globose, headlike cluster; fruit globose-ovoid, less than 1 cm. in diameter.

Tongatapu: *Home.*

'Eua: *Lister;* in thicket along trail to summit of eastern ridge, Mar. 30, 1953, *Yuncker 15553.*

Kao: climbing in open forest on steep rocky slope, May 6, 1953, *Yuncker 15894, 15895.*

Vava'u: *Crosby.*

Occasional in forested area. New Hebrides, Fiji, Polynesia.

Genus Borreria G. F. W. Meyer

Borreria laevis (Lamarck) Grisebach, K. Ges. Wiss. Goet., Abh. 7: 231, 1857.

Low, branching, ascending plant, slightly woody at the base. Leaves opposite, elliptic-lanceolate, sharply acuminate, base cuneate, mostly 2-4 cm. long and 5 mm. wide, pinnately nerved, nerves prominent, subsessile, stipules connate, with filamentous processes. Flowers small, white, in verticillate, axillary clusters.

Tongatapu: frequent in calcareous soil near sea, Sopu, west of Nuku'alofa, Feb. 25, 1953, *Yuncker 15007.*

'Eua: in pastured area near center of island, Mar. 22, 1953, *Yuncker 15428.*

Rather frequent as a weed in waste areas and clearings throughout Tonga. A tropical American species now widespread in tropical countries.

[1] /Morinda citrifolia -- Analyst/

Genus **Benincasa** Savi

Benincasa hispida (Thunberg) Cogniaux, DC. Monogr. Phanerog. 3:513, 1881. 137

Wide-spreading, hairy vine. Leaves rounded-ovate, base rounded, cordate, 5- or 7-lobed, up to 25 cm. or more wide, tendrils branched. Flowers yellow, 8-10 cm. or more wide, solitary, axillary, male flowers long-pedicellate; fruit oblong to cylindrical, up to 40 cm. long, hairy, flesh white, edible.

Vava'u: *Crosby.*

An Asiatic species now widely cultivated as a food plant.

The muskmelon (*Cucumis melo* Linnaeus), the cucumber (*C. sativus* Linnaeus), the watermelon (*Citrullus vulgaris* Schrader), the squash (*Cucurbita maxima* Duchesne), and pumpkins (*C. pepo* Linnaeus) are cultivated for their fruit. 824 244 262

FAMILY CAMPANULACEAE

Genus **Wahlenbergia** Schrader

Wahlenbergia marginata (Thunberg) A. de Candolle, Monogr. Campanul., 143, 1830.

Low, nearly glabrous herb with strong tap root, stem with numerous, slender, erect branches. Leaves small, alternate, linear-lanceolate, reduced, scalelike upward. Flowers blue, on very slender pedicels up to 3 or 4 cm. long, in few-flowered, branching, terminal clusters.

'Eua: in moist, grassy area on central plain approaching eastern ridge, Mar. 30, 1953, *Yuncker 15551.*

An Asiatic species rare in Polynesia.

Probably the same species collected on 'Eua by Lister and reported by Hemsley as *W. gracilis* A.DC.

Genus **Hippobroma** G. Don

Hippobroma longiflora (Linnaeus) G. Don, Gen. Syst. 3:717, 1834.

Thinly pubescent, sparsely branched herb up to 25 or sometimes 50 cm. in height. Leaves alternate, elliptic-lanceolate, acute, narrowed to sessile base, margin sharp-toothed, up to 10 or 15 cm. long, pinnately nerved. Flowers white, axillary, tubular, narrow tube up to 6 or 8 cm. long, lobes spreading to 3 or 4 cm.; capsule nodding, about 1.5 cm. long.

Tongatapu: local in low, moist situations about Nuku'alofa, Mar. 7, 1953, *Yuncker 15197.*

A native of tropical America widely distributed in the tropics where it often escapes from cultivation. The juice is said to cause skin irritation and the plant to be poisonous when eaten. In the most recent treatment of this group, Wimmer [Pflanzenr. 107 (IV. 276b): 405, 1953] discusses the species as *Laurentia longiflora* (L.) Endl.

'Eua: forming a thicket along strand just above high-tide limit, Lokupo, Mar. 27, 1953, *Yuncker 15535.* 137

Lifuka: in thicket, strand, north of Pangai village, Apr. 26, 1953, *Yuncker 15739.*

Vava'u: upper rim of coastal limestone cliff above Leimatua, May 25, 1953, *Yuncker 16080.*

Niuafo'ou: in thicket, summit of main crater rim, May 16, 1953, *Yuncker 16016.*

Common throughout Tonga along the strand (fig. 16). From India to Australia and Polynesia.

S. koenigii Vahl in Hemsley's list.

Tongan names: *ngahu, ngahu molemole.*

The bark[1] is used medicinally "to cure a leprosy-like disease and ringworm." [824]

[278]

Scaevola frutescens var. **sericea** (Forster) Merrill, Philippine Jour. Sci. 7C: 354, 1912. [757]

All parts of the plant densely silky pubescent.

Vava'u: along upper rim of seaside limestone cliff above Leimatua, May 20, 1953, *Yuncker 16077.*

Niuafo'ou: on upper rim of main crater, in thicket May 16, 1953, *Yuncker 16014.*

Occasional. Philippines to Polynesia.

Scaevola porrecta A. C. Smith, sp. nov. (fig. 17).

Herba suffruticosa porrecta ut videtur pauciramosa, ramulis teretibus pilis 1-2 mm. longis pallidis molliter vestitis; foliis alternatis, petiolis 1-2 cm. longis ut ramulis pilosis ad basim ampliatam anguste alatis, laminis in sicco subcoriaceis (in vivo forsan carnosis) fusco-olivaceis elliptico-lanceolatis, 4-6 (-7) cm. longis, 1.2-2.5 (-3) cm. latis, basi longe attenuatis et in petiolum decurrentibus, apice calloso-acutis, margine manifeste crenato-serratis (dentibus 2-3 per centimetrum callosis), utrinque pilis pallidis mollibus circiter 1 mm. longis adpressis ornatis, costa supra subplana subtus elevata, nervis aliis immersis; floribus in axillis bractearum solitariis sessilibus in spicis terminalibus laxis paucifloris 2-4.5 cm. longis dispositis, bracteis foliaceis oblongis apice obtusis callosis utrinque pilosis, maximis ad 20 mm. longis et 6 mm. latis, superioribus minoribus, bracteolis lateralibus similibus lanceolatis ad 8 × 1.5 mm.; calyce pilis numerosis pallidis 4-5 mm. longis basi circumdato, tubo ellipsoideo glabro saepe ruguloso 2-3 mm. longo 1.5-2 mm. lato, limbo erecto plerumque 0.5-1 mm. longo, lobis 5 praeter marginem ciliatum glabris plerumque parvis inconspicuis ad 0.5 mm. longis, lobo unico interdum lanceolato acuto ad 2.5 mm. longo; ovario biloculari, ovulis in quoque loculo solitariis; corolla alba membranacea 16-18 mm. longa, tubo utrinque inconspicue piloso intus faucibus setis deflexis 0.7-1 mm. longis paucis diffuse capitellatis obsito, lobis quam tubo paullo longioribus ovato-lanceolatis alis inclusis 2.5-3.5 mm. latis apice calloso-brevi-acuminatis utrinque glabris vel extus parce pilosis, alis membranaceis undulatis circiter 1 mm. latis; staminibus glabris, filamentis gracilibus 3.5-5 mm. longis, antheris oblongo-ellipsoideis 1.3-1.7 mm. longis; stylo gracili circiter 9 mm. longo copiose breviter piloso apice curvato incrassato, indusio membranaceo circiter 2 mm. diametro minute ciliolato, stigmate late cuneato complanato truncato; fructibus non visis.

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[1] /Scaevola frutescens -- Analyst/

Genus Youngia Cassini

Youngia lyrata Cassini, Ann. Sci. Nat. 23 : 88, 1831. 137

Slender herb, up to 30 cm. or more tall. Leaves alternate, lyrate, lobes with small, spinelike teeth, basal leaves up to 5 cm. long, much reduced upward. Flower heads scarcely 5 mm. long, numerous, yellow, on slender peduncles up to 2 cm. long, in much-branched, terminal and axillary clusters, pappus bristles capillary, white.

Tongatapu: weed in plantation near Nualei village, Mar. 9, 1953, *Yuncker 15227*.

Probably also grows elsewhere in Tonga as a plantation weed. Asia.

Ornamental species noted in cultivation are *Chrysanthemum* spp., *Coreopsis tinctoria* Nuttall, *Cosmos* spp., *Dahlia pinnata* Cavanilles, *Helianthus* spp., *Tagetes* spp., and *Zinnia elegans* Jacquin. [824] [247]

[p.272 is blank]

77: Whitcombe Y-3 (no date) 1930 OU9 Tonga OU9

NOTES ON TONGAN ETHNOLOGY

By J. D. Whitcombe[1]

HOUSE-BUILDING

342 [824] The framework of a native house is made of coconut palms thinned down to the sizes required. First the roof (*kahoki* or *sa*) is made: then the thin ribs (*aonui*) which run from end to end of the house. For the ceiling. heavier beams (*lalago*) are used; there may be two or four of these. depending upon the size of the house. Resting on the four house posts are two cross beams (*apai*). also of heavy coconut wood.

[824] Coconut wood is not used for the house posts. A stronger tree, such as the *koka*. the *filimoto*, the *gesi*. or the *boumuli* usually is chosen. When the house posts have been erected. the ceiling beams strongly bound with *kafa* put in place. and the ribs for the roof attached. the structure is ready for roof and sides. [824] The roof is usually thatched with coconut leaves or with *au* (a plant closely resembling the sugar cane). The leaves of the *au* do not rot as do those of sugar cane, and they withstand the weather so well that houses thatched with *au* have been known to last as long as fourteen years. The young *au* leaves (*ho au*) are threaded on split *kaho* sticks to make the thatch (*tui au*) which is tied to the roof ribs from the inside with *kafa*. The *tui au* is placed one row upon another. starting from the lower part of the roof and working toward the top. A mat *tapakau* made of the very young leaf of the coconut palm is placed under the thatch at the edge of the roof to catch the leaks. This serves as a rain spout (*tali tulutulu*). The roof is completed with a capping of coconut leaves, which are always used even though the thatching is done with *au*. The leaves are plaited. four usually being sufficient to cap a house.

The sides of most houses are made of coconut leaves or of *kaho* sticks. If coconut leaves are used they are first split and trimmed, then plaited and finally bound with *kafa* to the framework. The

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[1] The notes and vocabularies included in the following pages have been collected by Mr. J. D. Whitcombe, at one time Head of the Mission School at Mua, Tongatabu, but now of Devonport, Auckland, New Zealand. Most of the material has been gathered by Mr. Whitcombe from original sources, but some of it has been translated from manuscripts submitted by native students who were able by word of mouth to get from the old inhabitants first-hand information about the early customs and traditions of the Tongans. The material is presented here in the form of miscellaneous notes with the idea of making available to students of Tongan ethnology information which, though incomplete and scattered, may prove valuable for reference. [114] [115]

Fish nets (*finaki*). A fish net is made from the leaves of the
226 coconut palm. The roots are plaited into a round net very much like
[286] a lobster net; when ready it is sunk in the sea, weighed down by a
stone or some heavy weight. The fish swim into an opening in the net.

USES OF THE COCONUT PALM

The coconut tree is considered by the natives to be the most useful
● 824 tree in Tonga. It is indispensable in house building, and the number
[181] of articles made from its wood and leaves is remarkable. The heart
[278] of the tree is used for making walking sticks, the bark for medicine,
[226] the roots for a kind of fish net called *finaki*, the leaves for baskets,
[285] [342] thatching houses, and making mats and flooring. The uses of the
[352] fruit are innumerable.

824 As a medicine the fruit is given to pregnant women to increase
853 the supply of breast milk. For this the green nuts are used. A new-
[843] born child is always given *namoa*, which is made from the roasted
flesh of the ripe nut. This roasted flesh is chewed by someone,
usually a woman, and when taken from the mouth is rolled in a piece
of *fetaaki*, squeezed, and the juice given to the child. This is his
only food for four days.

Ripe coconuts are valuable for copra, which is the dried flesh.
824 This is sold to European markets largely, where it is used for soap,
[439] candles, oils, and a variety of products. The shells of the coconut are
[314] burned and made into charcoal (*malala*) for ironing. Kava cups also
[415] are made from the shells.

No native food is considered complete without the presence of
824 coconut in one form or another. Yams, fish, and bananas are usually
262 [252] cooked in the milk extracted from the flesh of the ripe coconut and
strained through coconut fiber.

Brooms are made from the ribs of the leaf, and the leaf stem is
824 used for stirring oil, also as weights for tapa which is spread on the
[412] ground for printing. The bark (*kaka*), which surrounds the leaves
[287] at the body of the palm, is used to make bags for wrapping arrow-
[415] root and medicines.

The several varieties of coconut palms have different uses.

VARIETIES OF COCONUT PALMS

245 KAFA. The nut is gathered when green and husked, the husk put in a native
824 oven and left for two weeks, after which it is taken out and beaten to re-
[285] move all the dust. The fiber thus obtained is plaited into mats.

NIU UI, NIU MEA. A clay-colored nut.

NIU MATA KULA. A red-eyed nut, used as a medicine for gum boils. 245

NIU MEAALAVA. A green nut, used as a medicine for gum boils in young children. The husk at the top of the nut is grated and spread over the boil. 824 [757]

NIU KAFAKALA. A great favorite among the chiefs, because of its perfect shape and size. The milk has a delicious flavor. [272]

NIU VAI. The largest coconut obtained in the South Seas. In the early days these shells were used for carrying water and when thus used were termed *hohoni*. [415]

NIU TAUKAVE. Has a small fruit.

NIU TEA. A white nut.

NIU UTOGAU. A nut with a sweet husk which the natives chew like sugar cane. [262]

NIU LEKA. This tree grows to a height of only ten feet and has a dwarf nut.

NIU KULA. A very different variety of coconut from all the others on the island. The nut is the size of a man's thumb; it has no milk, but a lump of white jelly surrounded by a thin, white, bitter skin. The tree is tall with a smooth body.

GAMES PLAYED BY CHILDREN

In the game, *kamotu'u*, several boys sit forming a ring; one goes 857
to the center, closes his eyes, and stands looking upward until a boy 524
from the circle touches him on the foot or leg. He then opens his eyes and goes to each boy in the circle, snapping his fingers in the face of each. When his fingers snap the loudest he has found the boy who touched him.

In *galigali a toke*, the boys stand in a row with hands on each other's hips. One player stands alone, facing the line. When the game begins, the line of boys starts running in a ring, and the lone player (*ell*), tries to catch any boy behind the leader of the line. While the game is being played this song is sung: "Galigali a toki, tuki be he ulu e toke." (Looks like an *ell* trap, but punch the *ell* on the head).

To play *touhuhu*, the boys hang a shaddock (*moli toga*) to a tree or stick and stand around it with sharpened sticks in their hands. One boy pierces the fruit with his stick, and strikes it to start it spinning around. The other boys then try to spear it while it is spinning, and the one who accomplishes this first wins the game.

Another game for boys is *tafau*. This is played with native bows and arrows. The weapon is made by taking a *kaho* stick about a yard long, splitting it down about twelve inches, and twisting one end of a piece of *fau* bark around the stick at the place where the split stops. The other end of the *fau* bark is held in the hand. The *kaho* stick or arrow is swung over the shoulder in playing, very much as if one

77: Whitcombe Y-3 (no date) 1930 OU9 Tonga OU9

173 from the village of Bea. When they reached Bea they found that the
425 report was only too true; Muliki Haamea was indeed dead.

Togalava and his friend then went in search of the murdered chief's body and they found it on the rock, Nukualofa. The murderers, before returning to Hihifo, had arrayed the body in its coronation robes, namely; the beautiful fine mats that the young chief was taking with him and that were to be worn by him when he was to be declared Tui Haamea, and to have his first kava under his new title.

On finding the body Togalava first bathed in the sea, and then sprang on to the rock and took all the mats off the dead body, and handed them to the other young man to carry. Togalava then put the body of the dead chief over his shoulders and carried it back to the village of Haateiho, a distance of about twenty miles, from the rock where they found it. When they got to Haateiho they built a bier on which the dead chief was placed and then brought to the village of Tatakamotoga, Mua, by five strong bearers—a farther dis-
173 tance of eight miles. When they arrived at Tatakamotoga a *tolia*
425 (house in which native chiefs are laid out to await the grave or vault
764 being prepared) was built. This *tolia* was built just under the big
kau tree on the government reserve at Tatakamotoga. The body was lying in state there while the *lagi*, known as Loamanu, was being built. It took six months to build this *lagi*. When all was ready, the funeral took place.

173 After the funeral had taken place the chiefs Maealiuaki and Fatea
125 with Tugi's chiefs [this would be Tugi I, as Tugi II is at present Prince Consort and Premier of Tonga] came to the man Togalava and said to him, "What is the value of the work which you have done for us," and Togalava replied, "Do not trouble," and they replied, "Here is the property of the late Muliki Haamea known as Toutai, and Tatai, also Toutai II. These are yours and to be your successors' properties for ever."

PLANTS USED IN THE TREATMENT OF DISEASE

824 **Akataha, Tava, Fekika vao.** For fever, stiffness of the jaws, or fixed eyes
278 in children. The trunks of the three trees are scraped and their juices mixed.

757 **Akau veli.** For bee sting. The plant is rubbed over the affected part.

192 **Bata, Kanume.** For *avaga*. The trunks of the two trees are scraped to obtain the juice, which is used as a drink.

Bolo. For *fefulai* or *kulokula ohu afi*. The leaves are chewed and the juice is painted over the affected parts.

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Bolo toga. For elephantiasis (*kulokula*). The leaves are pounded and the juice extracted to make a drink. 278

Bua. For trouble connected with the afterbirth. (See *manonu.*) 757

Ega. For sores on children. Used as a drink. (See *magele.*) 824

Fa, Fala. An emetic. The ends of the young shoots that hang downward are cut off and the juice extracted. 192

Fekika. To induce vomiting. For dysentery (*tuutuutoto*). (See *tava.*)

Fekika vao. For bee sting. (See *akataha.*)

Fiji uli, Hellala. For sore eyes (*tului tuhui oe mata ehe tevelo;* eye that has been pierced by the devil's finger). The leaves of the two plants are chewed together and the juice dropped into the eyes.

Fiki. For pain in the stomach (*laga oe kete*). The leaves are pounded and the juice extracted.

Fuekula. For constipation. The oil is extracted from the plant.

Gatae. Remedy for stomach pains and for *faka avaga* (one possessed of the evil spirit). The plant is pounded to extract the juice.

Hehea. For boils (*helaakilagi*). The stems or scrapings from the trunk are chewed and painted over the boil. For rheumatism (*feji ehe tevolo*) and *faka avaga* (one possessed of the evil spirit). (See *nonu.*) For indigestion (*makehekehe*).

Hellala. For boils (*hagatamaki*). For sore eyes. (See *fiji uli.*)

Hiapo kula. For diarrhoea in small children. (See *hogohogo.*)

Hogohogo. For blindness.

Hogohogo, Hiapo kula. For diarrhoea in small children. The roots of the *hiapo kula* and the leaves of the *hogohogo* are used.

Ifi. For infants who are restless in their sleep. The bark of the tree is chewed and juice sprayed over the child's body.

For an injury to the eye. The bark or small branches of the tree are pounded and the juice extracted is then dropped into the eye.

For blindness. The trunk of the *ifi* (horse-chestnut tree) is scraped and beaten to extract the juice.

Jiaine. For the illness of newborn infants. The juice of young green bananas (*jiaine*) is given the child, followed by a warm bath in which are placed *tavahi* leaves. [854]

Kanume. For *avaga.* (See *bata.*)

Kava. For stomach complaint.

Kava inu. For a boil termed *tae moe laavevela* which causes the body, or affected part, to look sunburned. The juice is extracted from the leaves of the drinking kava plant and painted on the affected part.

Kavakava ulie. For elephantiasis (*kulokula*). The leaves are minced and spread with the juice over the affected parts.

For boils which affect the whole body. (See *malolo.*)

Kili milo. Tonic for upset stomach or loss of appetite. (See *leki leki.*)

Lagakali. Remedy for a pain in the side.

Lautolu. For one who has suffered a relapse.

Lautolu, Tono. For *faka avaga.* The leaves from the two trees are pounded together.

Leki leki, Kili milo. Tonic for upset stomach or loss of appetite. The bark of both trees is pounded together and the juice used as a drink.

Lou fuji. For sores of children. (See *magele.*)

Lou lau tolu uta. For *faka avaga.* The leaves are pounded to make the medicine.

278 **Magele, Lou fuji, Ega.** For sores on a child. The bark is removed from the
757 roots of the *magele* plant, the *fuji* (banana) leaves are pounded, and the
824 *ega* (turmeric) added; all are mixed with water and given to father, mother, and child to drink.

192 **Malolo.** For a boil termed *matai ika* (fish eye) on the hand or leg. The leaves of the plant are chewed or pounded to a pulp and the juice painted on the boil.

For swelling in the neck (*kia tolo*).

For elephantiasis (*kulokula*). The juice obtained from chewing the leaves is applied to the affected parts.

For stomach pains and for *faka avaga.*

Malolo, Kavakava ulie. For boils which affect the whole body. The leaves from the *malolo* and the young shoots of the *kavakava ulie* are chewed or pounded together and the juice painted over the body.

Mamolo. For fever, stiffness of the jaws, or fixed eyes in children. The trunk is scraped and the juice extracted for a drink.

Manonu. For *faka avaga.* The trunk of the tree is scraped and the juice used as a drink.

[844] For women who are long in labor and can not give quick delivery.

Manonu, Bua. For trouble connected with the afterbirth. Both plants are used.

Mapa. For a boil termed *helaakilagi.* The young shoots of the plants are chewed and juice painted over the boils.

Milo. For *buhi bala.* The trunk is scraped to extract a juice for making children vomit.

Milo i tahi, Tono. For dysentery (*tuutuutoto*). The juice from the two plants is mixed and taken internally.

Mohokoi. For stomach complaint in old people.

Moli. For toothache. The bark is chewed.

Moli toga. For dysentery. (See *tava.*)

Monomono. For upset stomach. The trunk of the tree is scraped and the scrapings pounded with the fruit of the same tree to make a medicine termed *vai bala.*

Moosipo. For injury caused by poisonous fish (*nofu*). The leaves are pounded or chewed and the juice rubbed on the affected parts.

Niu Mea Alava. For *ila* (rash that appears on children). The nut of this tree is husked and the juice obtained from the husk is used as a medicine.

Nonu. For pains in the stomach. The young twigs of the plant are grated or chewed and juice painted over the stomach.

Nonu, Hehea. For rheumatism (*feji ehe tevolo*) and *faka avaga* (one possessed of of the evil spirit). The young leaves of the two plants are gathered and chewed together to make a medicine.

Ovava. For *tabitobito.*

Siale. For *avaga.* The trunk is scraped and the juice extracted.

Sipi. For fits (*teia*). The vine is scraped and the juice extracted.

Tava. For sore mouth in children. The trunk is scraped and the juice extracted to use as an external application.

For fever, stiffness of the jaws, on fixed eyes in children. (See *akataha.*)

Tava, Moli toga, Fekika. For dysentery (*tuutuutoto*). The trunks of these three trees are scraped to procure the juice, which is used as a drink.

Teebiloamaui. For stitch in the side, or shortness of breath (*uhuuhu*).

Toa. An emetic. The trunk of the tree is scraped and the juice extracted from the pulp. 278
The trunk of the tree is scraped and roasted to make *vai pala* (a medicine). 757

Toi. For *faka avaga* (one possessed of the evil spirit). The trunk of the tree is scraped to obtain the juice. 824 192

Tono. For dysentery (*tuutuutoto*). (See *milo i tahi.*)
For *faka avaga.* (See *lautolu.*)

Toto. For children with fever, stiffness of jaws, or fixed eyes. The trunk of the tree is scraped and pounded to extract the juice for a drink.

Toume. For wounded eyes. The dried sheath of the coconut flower (*toume*) is lighted and held by the native doctor. The patient is told to gaze into a coconut shell filled with sea water until he sees the reflection of the burning *toume* held above. As soon as he sees this reflection the doctor plunges the *toume* into the water and the eye is cured. [755]

Tutu'uli. Tonic or remedy for a relapse in any illness. The leaves are pounded to extract the juice.

Uhi. For boils (*hagatamaki*). This remedy is used for a special type of boil (*mole fua*) which does not come to a head. The plant is mixed with oil and painted on the boil.
For stomach pains (*haga tamaki*), also for toothache and gumboils. The plant is grated or pounded.

WORDS USED IN DESCRIBING THE HUMAN BODY

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Ahu: gall.
Aofinima: palm of the hand.
Aofivae: sole of the foot.
Ate: liver.
Atebili: spleen.
Ateivae: calf of the leg.
Avaiihu: nostril.
Bali: pubes.
Bito: navel.
Bule: pit of the stomach.
Bulobulaivae: ankle joint; bottom of the toes.
Ekenaki: voice.
Elelo: tongue.
Faefine: armpit.
Faimanava: stomach.
Fajitua: loins.
Fatafata: breast; chest.
Fatu: abdomen.
Fofoga: head; face (applied to chiefs).
Fogafoga: appearance; head and face.
Fulufulu: hair.
Gaajinima: finger nails.
Gaajivae: toenails.
Gakau: entrails.
Gao: double teeth.
Geejinima: finger nails.
Geejivae: toenails.
Gutu: mouth.
Halakava: beard.
Hi: semen.
Hiligaumoji: upper lip.
Hilo: anus.
Hiviivae: shin; fore part of the leg.
Huhu: breasts.
Hui: bone.
Huibalalulu: rib bone.
Huifohe: shoulder blades.
Huikouahe: cheek bone.
Ifo: taste.
Ihu: nose.
Jino: body.
Kakano: flesh.
Kalava: vein; blood vessel.
Kanoimata: eyeball.
Kanoimatauli: pupil of the eye.
Kauinima: fingers.
Kauvae: legs and feet.
Kemo: eyebrow.
Kete: belly.
Kia: neck.
Kiaivae: hollow of the leg under the knee.
Kili: skin.
Kofuua: kidneys.

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● 824

[For information on medicinal uses of plants, see Category 278.]

000 *zerumbet* as one component of an hallucinogenic mixture used in New Guinea.

● 824 III. Tongan Plant Nomenclature

Although Tongans do not seem to categorize plants into botanical orders, they make a distinction between Fungi, Lichenes, Musci, Pteridophyta, and Spermatophyta, and are usually able to recognize small differences between species. Most Tongans, from about age nine, can lead you to a plant given only its local name. However, Tongans are *not* always able to distinguish between similar plants and sometimes use the same name for more than one species. In some cases the same name is applied to 824 several different genera. Table I lists Tongan plant names that are applied to different 128 genera. If Yuncker (32) recorded these names from one or several locals who were unfamiliar with the flora, the list would be of no value. However, assuming that these Tongan names are accurate, I believe that, although Tongan morphological characteristics for distinguishing plants and their relatives may be different from ours, this list may provide insight into the statuses of genera the relationships of which in the plant kingdom are still somewhat enigmatic. For this purpose I have listed also the respective plant families. Plants in Table I with identical Tongan names found in two closely related families deserve closer examination.

824 The application of similar names to plants within different genera by the Tongan is not always due to carelessness, nor is it evidence that Tongans are unable to categorize plants systematically. The same name is sometimes applied because of common use of more than one species. *Curcuma longa* (Zingiberaceae) is known as *ango*, and *Zingiber zerumbet* (Zingiberaceae) is [278] called *angoango*. These plants obviously belong to different genera, but to the Tongan the fact that the rhizomes of both plants are used in similar medicinal preparations shows a strong enough relationship to indicate similar nomenclature. Similarly, the flowers of both *Cananaga odorata* (Annona-

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[2] Hylin, J. Personal communication to author. February, 1970.

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TABLE I
TONGAN NOMENCLATURE: UNCLEAR TAXONOMIC RELATIONS

Tongan Name (32)	Family	Scientific Binomial
ahivoa	Rutaceae	*Acronychia niueana* St. John
"	Meliaceae	*Vavaea amicorum* Benth.
akataha	Leguminosae	*Pueraria lobata* (Willd.) Ohwi
akataha hina	Leguminosae	*Alysicarpus nummularifolius* (L.) DC.
akataha kula	Nyctaginaceae	*Boerhavia diffusa* L.
kahiva'e	Gleicheniaceae	*Dicranopteris linearis* (Burm.) Under.
"	Polypodiaceae	*Hypolepis tenuifolia* (Forst.) Bern.
kalakala'uli	Flacourtiaceae	*Xylosma orbiculatum* (J. R. & G. Forst.) Forst. f.
"	Sapotaceae	*Planchonella costata* (End.) Pierri.
"	Ebenaceae	*Diospyros samoensis* A. Gray
kavahaha	Connaraceae	*Santaloides samoense* (Laut.) Schell.
"	Leguminosae	*Derris trifoliata* Lour.
"	Violaceae	*Agatea violaris* A. Gray
kavahuhu	Leguminosae	*Tephrosia purpurea* (L.) Pers.
"	Euphorbiaceae	*Euphorbia atoto* Forst. f.
kihikihi	Leguminosae	*Desmodium triflorum* (L.) DC.
"	Oxalidaceae	*Oxalis corniculata* L.
langakali	Meliaceae	*Aglaia saltatorum* A. C. Sm.
langakali vao	Rhamnaceae	*Elaeocarpus tonganus* Burk.
laufale	Polypodiaceae	*Nephrolepis hirsutula* (Forst. f.) Presl
"	Polypodiaceae	*Polypodium scolopendria* Burm. f.
loa	Malvaceae	*Hibiscus abelmoschus* L.
loa ano	Onagraceae	*Jussiaea erecta* L.
lolie	Apocynaceae	*Catharanthus roseus* (L.) G. Don
"	Apocynaceae	*Nerium oleander* L.
longolongo	Cycadaceae	*Cycas circinalis* L.
longolongo uha	Amaranthaceae	*Amaranthus viridis* L.
"	Compositae	*Emilia sonchifolia* (L.) DC.
mahelehele	Cyperaceae	*Cyperus javanicus* Houtt.
"	Cyperaceae	*Rhynchospora corymbosa* (L.) Britt.
"	Cyperaceae	*Scleria margaritifera* Willd.
maile	Apocynaceae	*Alyxia stellata* (Forst. f.) Roem. & Schultes
maile minití	Convolvulaceae	*Ipomoea cairica* (L.) Sweet
mamaea	Lauraceae	*Litsea mellifera* A. C. Sm.
"	Sterculiaceae	*Heritiera littoralis* Dryand.
misimisi	Cannaceae	*Canna indica* L.
misimisi koka'anga	Marantaceae	*Maranta arundinaceae* L.
mohuku'apopoa	Gramineae	*Digitaria pruriens* (Trin.) Buese
"	Gramineae	*Echinochloa colonum* (L.) Link
"	Gramineae	*Thuarea involuta* (Forst.) Roem. & Schultes
mo'osipo	Tiliaceae	*Triumfetta bartramia* L.
"	Tiliaceae	*Triumfetta procumbens* Forst. f.
"	Malvaceae	*Urena lobata* L.

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TABLE I (continued)

Tongan Name (32)	Family	Scientific Binomial
musie liku	Gramineae	*Thuarea involuta* (Forst.) Roem. & Schultes
musie matala pulu	Commelinaceae	*Commelina diffusa* Burm. f.
ngingie	Simaroubaceae	*Suriana maritima* L.
"	Lythraceae	*Pemphis acidula* J. R. & G. Forst.
ngingie'uta	Leguminosae	*Desmodium heterocarpum* (L.) DC.
"	Euphorbiaceae	*Euphorbia atoto* Forst. f.
olamaka	Celastraceae	*Gymnosporia vitiensis* (A. Gr.) Seem.
"	Elaeocarpaceae	*Elaeocarpus tonganus* Burk.
"	Flacourtiaceae	*Xylosma orbiculatum* (J. R. & G. Forst.) Forst. f.
"	Rubiaceae	*Canthium barbatum* (Forst. f.) Seem.
ponga	Marattiaceae	*Angiopteris commutata* Presl
"	Cyatheaceae	*Cyathea rugosula* Copeland
puataukanave	Myrsinaceae	*Maesa tongensis* Mez
"	Boraginaceae	*Cordia subcordata* Lamarck
puko	Hernandiaceae	*Hernandia ovigera* L.
"	Solanaceae	*Solanum vitiense* Seem.
siale mohemohe	Leguminosae	*Leucaena glauca* (L.) Benth.
siale matalateau	Rubiaceae	*Gardenia jasminoides* Ellis
tamanu	Leguminosae	*Maniltoa amicorum* A. C. Sm.
"	Guttiferae	*Calophyllum vitiense* Turrill
te'ekosi	Leguminosae	*Cassia tora* L.
"	Malvaceae	*Malvastrum coromandelianum* (L.) Garcke
"	Malvaceae	*Sida samoensis* Rech.
"	Labiatae	*Salvia coccinea* Juss.
tutuna	Icacinaceae	*Citronella samoensis* (A. Gr.) How.
"	Ebenaceae	*Diospyros samoensis* A. Gr.
vaine'initia	Passifloraceae	*Passiflora foetida* L.
"	Cucurbitaceae	*Momordica charantia* L.
vitahi	Olacaceae	*Ximenia americana* L.
"	Melastomaceae	*Memecylon harveyi* Seem.

[p.428-A]

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824 ceae) or *mohokoi* and *Artabotrys uncinatus* (Annonaceae) or *mohokoi honolulu* are used to scent oil.

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Table II consists of a list of 13 cases where identical Tongan names are applied to different species. This list is derived from those medicinal plants enumerated in section V which have Tongan names that are applied to other species. Assuming that the names are accurate and that there is a logical explanation, I have attempted to determine why these plants are given identical names. By asking the question "How

[p.428-B]

824 128 might an individual unfamiliar with the
principles of plant taxonomy known by our
culture categorize the plants of his environment?,"
I established the probable characteristics
upon which the Tongan may derive
his nomenclature. These characteristics may
not represent all those used by the Tongan,
although I am certain that some of the
824 following are of importance to him. My
hypothetical individual would probably first
assess the gross morphological characteristics
of a plant such as the type of plant (tree,
shrub, vine, fern, grass, moss, fungus, etc.).

[p. 428-C]

[TEXT CONTINUED ON PAGE 433-B]

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TABLE II

TONGAN NOMENCLATURE: COMPARATIVE MORPHOLOGICAL AND ECONOMIC CHARACTERISTICS

Tongan Name	Scientific Binomial (Family)	Plant Type	Leaf	Flower	Other	Economic Use
fue'aepuaka	1A *Ipomoea congesta*	vine	round-ovate	pale blue, short, pedicellate, funnelform		Leaves used in treating filariasis
"	1B *Pueraria lobata* (Leguminosae)	vine	pinnate, trifoliate	lilac-purple, in axillary clusters	pod	Used in medicines (32)
kihikihi	2A *Oxalis corniculata* (Oxalidaceae)	small herb	palmately compound, 3 leaflets	yellow, umbels	cylindrical capsule	Leaves used to cure convulsions
"	2B *Desmodium triflorum* (Leguminosae)	herb	alternate, primary 3 foliate	purple; 1, 2, or 3	pods	
laufale	3A *Phymatodes scolopendria* (Polypodiaceae)	fern	triangular ovate		sori large on lower surface	Pounded "leaves" used for filariasis and boils
"	3B *Nephrolepis hirsutula* (Aspidiaceae)	fern	serrulate obtuse		sori large, submarginal	
lolie	4A *Catharanthus roseus* (Apocynaceae)	herb	opposite, oblong, apex round	white, pink, in pairs, axillary, salverform		Plant used in medicines (32)
"	4B *Nerium oleander* (Apocynaceae)	shrub or small tree	whorled, narrow, oblong	in terminal cymose clusters		
malolo	5A *Glochidion ramiflorum* (Euphorbiaceae)	tree (up to 18 m)	alternate elliptic	small on slender pedicel	fruit grooved	Leaves used in treating food poisoning
"	5B *Glochidion concolor* (Euphorbiaceae)	shrubby tree (up to 8 m)	alternate elliptic	small on pedicel	fruit grooved	Leaves used in medicines (32)

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TABLE II (continued)

Tongan Name	Scientific Binomial (Family)	Plant Type	Leaf	Flower	Other	Economic Use
mangele	6A *Trema amboinensis* (Ulmaceae)	tree (medium size) 7–8 m	alternate oblong-ovate to lanceolate	very small in dense axillary clusters		Leaves used in medicines (32)
"	6B *Trema orientalis* (Ulmaceae)	tree (medium size)	alternate ovate-lanceolate	small in axillary cymes		Leaves used in medicines (32)
mo'osipo	7A *Urena lobata* (Malvaceae)	shrub (1 m)	alternate ovate	on short axillary pedicels, white to pink	fruit with barbed spines	Leaves used to treat burns, scalds. Roots and leaves used to cure diarrhea
"	7B *Triumfetta bartramia* (Tiliaceae)	shrub (2 m)	alternate round-ovate	small in axillary fascicles, yellow	fruit with hooked bristles	
"	7C *Triumfetta procumbens* (Tiliaceae)	prostrate, semi-woody	alternate round-ovate	in axillary umbellate clusters, yellow	fruit with pubescent bristles	
ngatae	8A *Erythrina variegata* (Leguminosae)	small tree	alternate, trifoliate pinnate, triangular-ovate	bright red, numerous in racemose clusters	pod 25 cm long, seeds dark red	Leaves used as cure for convulsions, in treating stomach ache
"	8B *Erythrina crista-galli* (Leguminosae)	tree up to 10 m	alternate, trifoliate	bright red on slender pedicels in racemose clusters		
polo	9A *Capsicum frutescens* (Solanaceae)	shrub (1.5 m)	alternate, ovate-lanceolate	white, small axillary pedicels	fruit ovoid, 2.5 cm, bright red	Frequently used in many remedies

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TABLE II (continued)

Tongan Name	Scientific Binomial (Family)	Plant Type	Leaf	Flower	Other	Economic Use
polo (cont.)	9B *Rivina humilis* (Phytolaccaceae)	shrub (1 m)	alternate, ovate-lanceolate	white or greenish, on slender pedicels in terminal and axillary racemose	fruit red fleshy	Red juice of fruit used as a dye (32)
tamanu	10A *Calophyllum inophyllum* (Guttiferae)	tree	opposite, oval, subovate	white, in axillary racemose clusters	fruit globose 3–4 cm in diam, one-seeded	Oil from seeds is used in treating rheumatism (4)
"	10B *Calophyllum vitiense* (Guttiferae)	tree	opposite, oblong-elliptic	pink, axillary racemose clusters	fruit subglobose 2 cm in diam	Timber is used for building purposes (32)
te'ekosi	11A *Ageratum conyzoides* (Compositae) (see Asteraceae)	herb	opposite, ovate	blue, in terminal and axillary clusters	pappus of 5 awned scales	Leaves applied to infected wounds
"	11B *Cassia tora* (Leguminosae)	woody plant (1 m)	alternate, oval	yellow, in axillary pairs	pods slender	
"	11C *Malvastrum coromandelianum* (Malvaceae)	shrub (1 m)	alternate, ovate	salmon yellow, in axillary and terminal clusters		
"	11D *Sida samoensis* (Malvaceae)	herb	alternate, oval	solitary on slender axillary pedicels		

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TABLE II (continued)

Tongan Name	Scientific Binomial (Family)	Plant Type	Leaf	Flower	Other	Economic Use
"	11E *Salvia coccinea* (Labiatae)	herb (60 cm)	opposite, ovate, acute, or obtuse	bright red or pink		
tono	12A *Centella asiatica* (Umbelliferae)	herb	clustered at nodes, orbicular ovate	white or pink, very small, scant in axillary umbels	fruit round, compressed, ribbed	Leaves used as poultices (32), in tonics, and for treating convulsions
"	12B *Carinta herbacea* (Rubiaceae)	herb	opposite, rounded, cordate	white, small scant in axillary umbels	fleshy, red	Leaves are used in medicines (32)
volovalo	13A *Premna taitensis* var. *rimatarensis* (Verbenaceae)	shrub or small tree	opposite, ovate, acute, or obtuse	greenish white, small, in terminal puberulent panicles	fruit globose (6 mm diam)	Bark is used in tonics
"	13B *Premna obtusifolia* (Verbenaceae)	shrub or small tree	opposite, oblong-ovate	greenish white, small, in terminal branching clusters	fruit globose (3 mm diam)	

TABLE III

TONGAN NOMENCLATURE: CLEAR TAXONOMIC RELATIONS

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Tongan Name (32)	Scientific Binomial
'apele'initia	*Annona muricata* L.
'apele papalangi	*Annona squamosa* L.
fa	*Pandanus tectorius* Park.
fa hina	*Pandanus odoratissimus* var. *pseudo-linnaei* Martelli
fa kula	*Pandanus corallinus* Martelli
fa vula	*Pandanus odoratissimus* var. *pyriformis* Martelli
falahola	*Pandanus odoratissimus* var. *sinensis* Warb.
faina (Pineapple, fruit of medium size, leaf margins spiny.)	*Ananas comosus* (L.) Merr.
faina ha'amoa (Fruit large and not as sweet as others.)	
faina'initia (Leaves at top of fruit red.) (Y)	
fau	*Hibiscus tiliaceus* L.
fau'ingo	*Hibiscus abelmoschus* L.
fekika kai	*Syzygium malaccense* (L.) Merr. & Perr.
fekika papalangi	*Syzygium jambos* (L.) Alston
fekikavao	*Syzygium dealatum* (Burk.) A. C. Sm.
fiki	*Jatropha curcas* L.
fiki papalangi	*Jatropha multifida* L.
filo	*Plantago major* L.
filohako	*Plantago lanceolata* L.
kava	*Piper methysticum* Forst. f.
kavakava'uli	*Piper puberulum* var. *glabrum* (C. DC.) A. C. Sm.
mo'ota	*Dysoxylum forsteri* (Juss.) C. DC.
mo'ota kula	*Dysoxylum tongense* A. C. Sm.
polo	*Capsicum frutescens* L.
polo pa	*Physalis angulata* L.
all Solanaceae	
polo kai	*Solanum nigrum* L.
polo tonga	*Solanum uporo* Dunal
telie	*Terminalia catappa* L.

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Table III (continued)

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Tongan Name (32)	Scientific Binomial
telie'amanu	*Terminalia litoralis* var. *tomentella* Hemsley
vaine'ae kuma	*Passiflora laurifolia* L.
vaine'initia	*Passiflora foetida* L.
vaine kai	*Passiflora maliformis* L.
vaine tonga	*Passiflora edulis* Sims

Other clear examples of plant recognition by the Tongan may be observed in the native names for varieties of the following:

a. *Saccharum officinarum* L.
b. *Artocarpus altilis* (Park.) Fosberg
c. *Ipomoea batatas* (L.) Poiret
d. *Carica papaya* L.
e. *Mangifera indica* L.
f. *Manihot esculenta* Crantz
g. *Citrus maxima* (Burm.) Merr.
h. *Cocos nucifera* L.

824 the arrangement of the leaves, the leaf shape, the flower color and arrangement, and the sexual characteristics (i.e., "male" plant or "female" plant). He might also evaluate the virtue and uses of a plant, such as food value or taste, utility as a component in the construction of shelters, value in the design or manufacture of clothing or ornaments, suitability for fuel, effectiveness as a fish poison or as medicine. On the basis of these qualities and uses and the morphological characteristics listed above, the individual might have sufficient data to classify the plants of his environment. The number of species in Tonga is not large, and therefore the potential for giving names to all species found in the archipelago through permutation and combination of the above features is theoretically possible.

A good example of Tongan plant recognition may be seen in the genus *Syzygium.* Of the nine species found in the archipelago three species are considered close relatives as evidenced by the Tongan names. Thus, *Syzygium jambos* is called *fekika papalangi*, *S. malaccense* is known as *fekika kai*, and *S. dealatum* is named *fekikavao.* Further examples of fine distinctions between plants made by the Tongan may be found in Table III. If one variety of a plant is recognized, a single word is commonly applied.

[p.433-B]

824 If two or more varieties are recognized, descriptive names are attached to a common base name. Some examples of commonly used descriptive names are as follows:

1. (Colors)
   hina, white; *kula*, red; *uli*, black
2. (Locality)
   vao, the forest; *tahi*, the seashore; *utu*, cliffs; *uta*, inland; *ano*, swamp
3. (Anatomical features)
   matolu, thick; *hako*, long; *talatala*, prickly, thorny; *tolu*, trifoliate; *leka*, dwarf; *puku*, short; *lalahi*, large; *molemole*, smooth; *petepete*, rough
4. (Food value)
   kai, edible; *kona*, poisonous; *fifisi*, hot
5. (Country of origin)
   fisi, Fiji; *ha'amoa*, Samoa; *honolulu*, Honolulu; *initia*, India; *papalangi*, Europe

Names sometimes refer to bodily parts or function: e.g., *Te'ete'emanu* (*Ercatamia orientalis*) is translated as "the animal that lives within the gum and causes tooth decay." This species happens to be used in treating toothache. *Te'epilo'amaui* (*Geniostoma* spp.) means "fecal matter of the god Maui," referring to the bark, which is used medicinally and has a very disagreeable odor.

[192] Also, there has been much borrowing of Western language in Tonga, as apparent in the Tongan names for cultivated plants.

Tongan Name	Western Name
kofi	coffee
kuava	guava
mango	mango
manioke	manioc
pasione	passion flower
tapaka	tobacco

IV. Field Work

122 In Tonga I stayed in a small boarding house that catered to resident Europeans on extended tours in the archipelago. One of the other guests was an officer with the World Health Organization who had been
[124] working in Tonga for four years. A coworker of hers at the government hospital

115 Tolu Ha'angana

(Agricultural Officer. Assistant to T. G. Yuncker when he was collecting in Tonga.) Field work, discussions, medical uses of plants.

Preben Kauffmann (Tavi)

(Expatriate from Denmark, 17 years in Tonga, friend of King Tupou IV and integral member of his community. Vegetarian.) Plants and medical uses.

Latu Toili

(Driver for Medical Department.) Plants and medical uses.

Te'ekiu Village:

Amato Uia

(A renowned practitioner with 45 years experience.) Medical uses of plants and discussions.

128 A total of 91 remedies were recorded.
Included in these remedies were 59 different
species of plants used by at least two differ-
ent informants. References to an additional
128 17 species of reputed value but not met with
127 in the field are included from the literature
(29).

The general procedure for gathering data
124 consisted of interviewing informants in their
villages. With the aid of an interpreter,
data were gathered in four categories. Ton-
gan name of the plant, the part utilized in
preparing the medicine, the illness, and the
preparation, dosage, and administration.
124 Where the informant was agreeable, a walk
through the village or surrounding "bush"
126 usually allowed collection of described plant
specimens. In the few cases where the
informant was either too busy or too infirm
to accompany the investigator, the described
plants were collected under the guidance of
a direct relative or friend familiar with the
habitat.

In some cases it was necessary to collect
the described species with the aid of an
agricultural officer, going only by Tongan
[824] plant names. Although this method is open
to doubt in other regions of the Pacific
because of variations in dialects, the Tongan
language is constant as far as plant names
are concerned. There are variations on
descriptive names, but all base names of
plants encountered were identical from one
informant to another. This was verified
through repeated checking.

124 Further reassurance regarding the consistency of plant names came while I was
126 drying plant material later to be used as crude drug samples. As individual trays of desiccated leaves and bark were removed from copra driers, Tongan workers who had inquisitively gathered would attempt to call out the identity of the dried contents before the attached identifications were exposed.
[824] Most men were able to identify the plant names correctly, relying solely on their ability to interpret the scents and shapes of the desiccated samples.

V. Enumeration of Tongan Medicinal Plants

126 Specimens of 59 species of plants were collected on Tongatapu Island. The plants
128 were identified by using Yuncker (32) and also by a study of specimens available at the Herbarium of the Bishop Museum. Final determinations were established by Dr. A. C. Smith of the University of Hawaii. Voucher specimens are on deposit at the Bishop Museum.

Following is an enumeration of plants utilized as medicines by the Tongan people.
128 This list includes my own observations as well as those reported in the literature.
127 Families, genera, and species are arranged alphabetically. Tongan vernacular names and geographical distributions of each species, as given by Yuncker (32), are included.

128 The medicinal applications of each species in some other regions of the Pacific are enumerated to show their popularity in use.

278
AMARANTHACEAE
(Amaranth Family)

137 **Achyranthes aspera L.**

tamatama

This pantropical species is common throughout the archipelago.

278 In Tahiti the roots are used in treating mouth sores, toothache, and syphilitic sores
171 (19). It is reported that the plant is employed in medicines in Niue (31). In the Philippines the leaves and roots are valued as diuretics and the sap for treating cataracts (21).

278 In Tonga the leaves are used to tie
752 wounds after circumcision (32), and after

278 171 cataracts, the roots are employed in combatting beriberi, syphilitic infections, and dysentery. The leaves of this plant are smoked like tobacco. Usage in other countries is reported (21).

278 In Tonga the bark is pounded and the juices applied in treating ringworm.

757

GUTTIFERAE

(Mangosteen Family)

278 137 **CALOPHYLLUM INOPHYLLUM L.**

feta'u, tamanu

This species occurs frequently near the sea in Tonga. It is distributed from eastern Africa and India through Malaya and Polynesia.

278 171 The oil extracted from the seeds is used in Samoa in treating rheumatism (12). Quisumbing (21) reports that it is poisonous and that the Samoans use parts of the plant in preparing an arrow poison. In New Caledonia the sap is applied to wounds, and oil from the seeds enters into the preparation of a digestive aid (19). Natives of the Philippines value the oil from the seeds and leaves in treating eye disorders; the oleoresin is applied to wounds, and an infusion of the leaves to hemorrhoids. Oleoresin from this species is official in the Mexican and Spanish Pharmacopoeias (21).

278 757 In Tonga the oil is a well-known remedy for rheumatism (4).

278 137 **GARCINIA SESSILIS (Forst. f.) Seem.**

heilala

This tree, occasional in Tonga, occurs also in Fiji and Samoa.

278 171 In New Guinea a species of *Garcinia* from the Zenag, Nondugl, and Popondetta regions contains saponins and other steroids (30). In the Philippines the leaves and bark of *G. mangostana* L. enter into astringent and febrifuge preparations. The pericarp is used in curing chronic intestinal catarrh (21).

278 757 [828 [775 In Tonga this plant is frequently employed medicinally. The leaves are squeezed in water and applied to skin rashes; a decoction of young leaves is considered helpful for stomach ache in children or for infants suffering from a "sleeping fit." When it is believed that ghosts have caused hallucinations in a patient an infusion of the leaves is prepared and administered.

278
137

RHAMNACEAE
(Buckthorn Family)

Alphitonia zizyphoides (Spreng.) A. Gray
toi

This large tree is frequent in Tonga and is distributed also from Sumatra and the Philippines eastward to Polynesia.

278 In Tahiti the bark enters into lotions for treating eczema (19).

[171] [757] [841] In Tonga the liquid derived from the boiled bark is drunk in cases of constipation, for coughs, headache, and menstrual pain.

RUBIACEAE
(Coffee Family)

278
137

Carinta herbacea (Jacq.) W. F. Wight, ex Saff.
tono

This pantropical species is occasional in Tonga.

278 846 In Tonga the leaves are crushed, placed in a cloth, and then squeezed in a small quantity of water. The wet cloth is sucked by newly born infants. The liquid is thought to help make the meconium pass.

278 **Gardenia taitensis** DC.
siale

137 Frequently planted in Tonga for its flowers, this species occurs also in Fiji and throughout Polynesia.

278 171 In Tahiti an infusion of the flowers is taken as a remedy for migraine headache (19). In Niue the root-bark is considered a treatment for headache (31), while in the Philippines the fruits of *G. pseudopsidium* (Blanco) Vill. are used against smallpox (8).

278 757 [843] [775] [828] In Tonga an infusion of the bark mixed with sugar and lime juice is employed to relieve nausea, headache, and weakness in pregnancy. A plain infusion of the bark is valued as a cure for hallucinations thought to be caused by the ghost of a deceased relative.

Guettarda speciosa L.
278 *puopua*

137 This tree is commonly found near the shore in Tonga, and is widely distributed throughout Polynesia.

than the way in which they noose sharks; instances of sharks attacking 226 natives are very rare. Whales are sometimes caught. Turtles are also 225 plentiful. Perhaps the most interesting creature in Tonga is a land-tortoise, now kept in the Palace grounds at Nuku'alofa, and reputed to 231 have been left by Captain Cook; it has been scarred by bush-fires and 825 other accidents, but in its old age it is honoured as though it were a chief and is called Tu'imalila, after a part of Labaha called Malila. 552

The graceful coconut-palm is the most distinctive as well as the 245 most valuable of plants in Tonga. All parts of the islands being very close to the sea, coconut trees thrive everywhere, and copra, the dried kernel of the nut, is the staple product. Other plants which grow in 241 profusion are many varieties of banana, plantain, yam, sweet potato, talo, manioc, sugar-cane, pineapple, breadfruit, papaw-apple, mango and arrowroot. Coffee, cocoa and cotton have been introduced but are not yet extensively grown. Various European vegetables have also been introduced, and corn has proved the best cereal for this climate.

Bananas, sweet potatoes, pineapples, tomatoes, pumpkins and 439 oranges could be exported in abundance, if markets were available. The staple foodstuffs of the people are yam, sweet potato, talo, manioc, kabe, 262 plantain, breadfruit, etc.

The bark of the paper-bark mulberry is extensively used for making 824 native cloth (taba and gatu), and the sap of the koka tree is used for [287] stamping this cloth. Mats are made from the leaves of the pandanus, but unfortunately this domestic manufacture is declining generally, [285] except in Ha'abai. The trunks of the toa (ironwood) and koka are used [178] for the posts of native buildings, but timber generally suitable for building [313] European houses is not found in Tonga. The ironwood or casuarina tree was used for making clubs and spears formerly, and is still used for spade handles and mallets. The best of the old canoes were brought 505 from Fiji, where more suitable timber for all purposes is available. 439

Kava, the juice of a species of pepper-plant, is the national drink 276 on all occasions. Other interesting trees are the ovava, a species of banyan; gatae and tuitui (candle-nut) used for marking boundaries; 137 Malayan apple or fekika, tava, and the ifi, whose leaves were hung round the neck in token of surrender or penitence in olden times. 824

Government statistics in 1931 show a total of 2,658,644 coconut 245 trees and 832,655 banana plants in the Kingdom, 94% being owned by Tongan cultivators.

EXPORTS.

Tonga is entirely an agricultural country, being without minerals 433 and secondary industries. It is unfortunate that there are still fairly 433 considerable areas of undeveloped land even in such a small country, especially in Togatabu and 'Eua, and further that several hundred tax- 311 payers have no allotments; this latter condition is mainly due to indolence on the part of some who live in the chief towns, but in the case of the overcrowded islands of Ha'abai it rises from rather a natural reluctance to leave an old home. The Government is now making strenuous efforts 179 to enforce both more systematic cultivation of coconut-growing land and 245

000 made to farm it. The characteristic plant species do,
311 however, provide a valuable resource to the owner in terms
824 of timber, medicinal plants, pandanus fiber, plaited-ware,
wood for carving, and many other useful products.

137 Coastal Savanna

311 The coastal savanna vegetation is restricted to a
narrow zone of flat limestone terraces along the south and
east coasts, which is continually under the influence of
137 intense salt spray. Along the seaward margin, the vegetation on the exposed coral limestone is similar to the
outer margins of portions of the coastal littoral forest.
The vegetation is characteristically prostrate, with
Pemphis acidula, Sesuvium portulacastrum, Portulacca
samoensis, and Fimbristylis cymosa predominating among the
cracks and shallow soil pockets in the limestone. The
savanna itself, which never extends much more than 100
yards (90 meters) inland, is comprised of an understory
of grasses including Spinifex littoreus, Thuarea involuta,
and Ischaemum murinum along with Wedelia biflora, Canavalia
sericea, Vigna marina and Cassytha filiformis. Throughout
this understory of low herbaceous vegetation, scattered
concentrations of Pandanus tectorius, Scaevola sericea
and Tournefortia argentea occur. Immediately inland from
the open savanna vegetation are found almost pure stands of
Pandanus tectorious, which grade into coastal littoral
[311] forest. The coastal savanna, of all the vegetation

842 definite barriers to the success of family planning in
Tonga. One of the foremost is the cultural desirability of
163 having large families. The average fertility rate, based
on the study, was estimated at 7.3 births per woman (Wolff
000 and De Sarmo, 1970:6-23). Even if the birth rate were
reduced to two per cent per annum, the Kingdom's population
in 1996 would be close to 150,000, with over 100,000 on
Tongatapu; the population density for Tongatapu would then
be over 1,000 people per square mile (386 per square kilometer)
or approximately 17.7 persons per bush allotment
(based on the present number of 5,652 bush allotments on
161 Tongatapu). The estimated population density for Tongatapu
at the time of this study in 1971 was 626 persons per
square mile (about 242 per square kilometer) or about 10.4
000 persons per bush allotment. Such a population increase
will inevitably change the existing agricultural system
through a shortening of fallow periods and a reorientation
241 of cropping practices and plant selection. Incipient
182 changes are already taking place with the supplanting of
yams, bananas, and taro as the main subsistence crops by
manioc, which has a shorter growth period and will continue
to produce high yields when planted repeatedly on the same
000 plot. Finally, there will be further increases in the
number of landless Tongans who will have to look for employment
outside the agricultural sector.

000 Tongan men and women. Wild or cultivated *Pandanus* leaves,
291 coconut fronds,and stems cf wild plants such as *Hibiscus*
824 *tiliaceus* or *Eleocharis dulçis* are sources of fiber from
287 which the various types of *ta'ovala* are made. The tapa
248 cloth or *ngatu* is prepared from the inner bark of the
paper mulberry plant (*Broussonetia papyrifera*), which is
291 planted as a crop in the bush gardens. Belts or twine used
824 to hold the garments in place are often made out of either
coconut or *Hibiscus* fiber.

342 In the case of housing or shelter, the role of the
241 agricultural system is again of considerable importance as
342 a source of materials. Table 19 is an enumeration of
128 housetypes found as part of the survey of 192 allotments on
Tongatapu. Although it is often difficult to distinguish a
342 "small wooden" house from a "large wooden" house, there is
no doubt that almost half of the major dwelling units are
342 of the traditional thatched variety(*fale Tonga*). A *fale* is
824 constructed with plaited coconut fronds for walls and roofing; coconut and other local timber for poles, beams
and framework; and coconut fiber and the inner bark of
Hibiscus tiliaceus for lashing and tying the roofing down.
In some cases, varieties of bamboo (*Bambusa* or *Miscanthus*)
are used for walls. The leaves of a type of sugarcane, *au*,
are used in the construction of a superior and long-lasting
thatched roof. Even wooden houses are often constructed
partially or entirely from local timber.

434 438 Table 21. Number of times specified items were listed as being commonly purchased at small village stores (based on 120 questionnaire responses).

Bread	90
Soap	84
Sugar	82
Kerosene	74
Salt	60
Tinned Fish	57
Flour	54
Matches	41
Tinned Beef	35
Mutton Flaps	34
Cigarettes	31
Bleach	20
Butter	27
Curry Powder	20
Tobacco	14
School Supplies	12
Onions	8
Cocoa	7
Jam	7
Canned Milk	6
Candy	6
Razor Blades	6
Tea	5
Hard Biscuits	5
Thread	5
Starch	5
Batteries	5
Laundry Soap	5
Soda pop	5
Material	4
White Gas	3
Lard	3
Toilet Paper	3
Face Powder	2
Perfume	2
Baking Powder	2
Watermelons	2
Buns	2
Pepper	1
Coffee	1
Needles	1
Aspirin	1
Cheese	1
Soup	1

439 [824] [237] The exported handicrafts and curios include plaited ware, tapa cloth, leis, necklaces, slippers, or skirts made primarily with local plant materials. A small proportion, however, consist of sea shells and other objects collected from the surrounding reefs.

434 Table 22. Continued.

438

Table cloth	1	Fertilizer	1

439 The fungus, Auricularia polytricha, which is exported
137 to Hong Kong, is classified as an agricultural product by
824 the Tongan Government, and although most of it comes from
the island of 'Eua, some is still found during rainy periods
on dead logs in forested areas of bush allotments on
Tongatapu.

439 At present there is a concerted effort being made by
179 the Agricultural Department and the Tonga Commodity Boards
652 to diversify and increase agricultural exports in order to
179 stabilize the economy. These efforts have increased
241 production of garden vegetables, pineapples, watermelons,
root crops, and, more recently, vanilla. ~~Nevertheless,~~
439 the major export crops continue to be coconuts and bananas.
245 Unfortunately, the market for copra is highly unstable,
and both crops are susceptible to disease, pests, hurricanes,
[505] and periodic droughts. In the case of bananas, exports
depend on unreliable shipping services to New Zealand.
Nevertheless, coconuts and bananas are still the major
commercial crops found on the traditional bush allotment.
Consequently it is important to have some background on the
production of these crops.

Copra and Other Coconut Products

Prior to World War II independent traders throughout

[TEXT CONTINUED ON PAGE 156]

241
369 **Table 49. Continued.**

Plant	Nuku'alofa	Rural	Total
Peanuts	1	0	1
Cabbage	1	0	1
Carrots	1	0	1
Cucumber	1	0	1

241
[369] corn (Zea mays) are cultivated to a lesser extent. Again, cultivation of these plants is much more frequent on town allotments in Nuku'alofa than in the rural areas.

Important Non-Food Crops

There was an even greater range of important non-food plants which were either cultivated or protected on the sample town allotments (Table 50). The most widespread plants were those useful for handicrafts and the preparation of other material objects (Appendix E),[A] and included
241
824

[TEXT CONTINUED ON PAGE 301]

241
369 Table 50. Frequency occurrence of specified non-food plants on 192 town allotments (113 in Nuku'alofa and 79 in rural villages).

Scientific Name	Nuku'alofa	Rural	Total
Pandanus sp.	51	12	63
Gardenia jasminoides	34	24	58
Pandanus sp.	47	4	51

[A] [See Category 116, pp. 377-431--Analyst.]

241
369 **Table 50. Continued.**

Scientific Name	Nuku'alofa	Rural	Total
Nicotiana fragrans	1	0	1

241 a number of varieties of Pandanus (tofua, tapahina, paongo
● 824 and kie), as well as Gossypium brasiliense, Coix lachryma-
jobi, Broussontia papyrifera, and Maranta arundinacea.
241 Also of considerable importance were plants used for tradi-
824 tional house and body ornamentation: Gardenia spp.,
278 Coleus amboinicus, Hedychium spp. (tevunga and teuila),
and Artabotrys uncinatus; and for medicinal purposes:
Achyranthes aspera, Zingiber zerumbet, Vigna marina,
Curcuma longa, Jasminum spp., Piper puberulum, and Wedelia
[226] biflora. The others are all used in some way (Appendix E), A
such as Derris elliptica, which is used for stupefying
241 fish. Although there is a considerably higher frequency
369 of non-food plants than food plants on rural town allot-
ments, there is still a higher frequency of these plants on
Nuku'alofa town allotments.

Important Tree Species

241 **Fruit Trees**

245 Fruit trees were the dominant vegetation type on most
369 town allotments, both in Nuku'alofa and in the rural

A[See Category 116, pp. 377-431--Analyst.]

241 traditional plants and trees to recent introductions. This
178 is already evident in the increasing importance of manioc,
American taro, and sweet potato as well as in the increasing
cultivation of peanuts, watermelons, pineapples, garden
278 vegetables, and improved banana clones. Although still of
824 widespread importance, the use of traditional folk medicine
[178] is gradually giving way to an increasing acceptance of
modern medicine. Consequently, the great range of plants
and trees used for this purpose may become more expendable.
824 A similar trend exists for trees once valuable for scenting
178 coconut oil, cordage, dyes, soap substitutes, and fish
poisons.

241 An even more pronounced trend, is the replacement of
137 native secondary vegetation by exotic species due to the
178 continual reduction in the duration of fallow periods. The
native forests have had insufficient time to re-establish
themselves and the more hardy introduced pioneer species
are now the dominant vegetation on almost all fallow land
241 on Tongatapu. This rapid expansion of weedy vegetation is
a major problem limiting agricultural production. In
addition to their inferior ability to store soil nutrients,
their removal often constitutes a very high labor input,
and in some cases, because of their increasing occurrence
after the extension of cropping periods, cultivators are
[171] often forced to shift to new plots. Watters (1958:344)
found this the case in Samoa, where, after three successive

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Appendix E. Listing of scientific names, families, Tongan names, English names, and uses of plants discussed in the text as major components of the Tongatapu agricultural system and natural vegetation associations (the numbers in parentheses refer to the sources of information ; Tongan words listed in uses section are listed at the end).

Sources: 1) field research including field reconnaissance, interviews with Tongan farmers and sellers at Talamahu Market in Nuku'alofa; 2) Siua 'Ofa, a practitioner of Tongan folk medicine who sells his medicine at Talamahu Market; 3) Yuncker (1959); 4) Weiner (1971); 5) Merrill (1943); 6) Barrau (1961); 7) Massal and Barrau (1956); 8) Whitcombe (1930); and 9) Parham (1972).

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Abrus precatorius Linn.	Leguminosae	moho		seeds used for making necklaces and other ornamentation (1,3).
Acacia simplicifolia (Linn. f) Druce	Leguminosae	tatangia		leaves used medicinally; seeds used occasionally for necklaces; wood used for carving, handicrafts and for firewood (1,2,3).
Acalypha wilkesiana Mueller-Argoviensis	Euphorbiaceae	kalakala 'apusi	beefsteak hedge	ornamental used as hedges and living fences (1,3,5).
Achyranthes aspera Linn.	Amaranthaceae	tamatama		leaves and sap used medicinally (1,2,3,4).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Acrostichum aureum Linn.	Polypodiaceae	*hakato*		parts used medicinally (1,2,3).
Adenanthera pavonina Linn.	Leguminosae	*lopa*	red sandalwood, bead tree.	seeds often eaten while green; wood used in handicraft and carving; seeds used in making necklaces and other ornamentation (1,3,6).
Ageratum conyzoides Linn.	Compositae	*te'ekosi*		leaves used medicinally (1,2,4).
Aglaia saltatorum A.C. Smith	Meliaceae	*langakali*		leaves and bark used in medicines; flowers used in leis, garlands and for scenting coconut oil (1,2,3,4,8).
Albizzia lebbeck (Linn.) Bentham	Leguminosae	*kasia*		timber used for a variety of purposes including woodcarving (1,3).
Aleurites moluccana (Linn.) Willdenow	Euphorbiaceae	*tuitui*	candlenut	fruit and bark used medicinally; oil from fruit used as a soap substitute and for scenting coconut oil; extract of bark used as a

Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				dye for tapa cloth; planted as boundary markers; seeds often chewed and used in leis (1,2,3,5,6,7).
Allium ascalonicum Linn.	Liliaceae	*onioni Tonga*	green onion, shallot	used as a spice and vegetable, both raw and cooked (1,3,6,7).
Allium cepa Linn.	Liliaceae	*onioni Palangi*	bulb onion	used as a spice and vegetable both raw and cooked (1,3,7).
Alocasia macrorrhiza (Linn.) Schott	Araceae	*kape*	giant taro	cooked as a staple vegetable (1,3,5,6,7).
Alphitonia zizyphoides (Solander) A. Gray	Rhamnaceae	*toi*		bark and leaves used medicinally; leaves used as a soap substitute; wood makes excellent timber which is used for banana shooks, canoes, tapa beaters, handicrafts and firewood (1,2,3,4,8).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Alyxia stellata (Forster f.) Roemer Schultes	Apocynaceae	maile		stems, leaves and flowers used in leis and for scent-coconut oil; leaves used medicinally; roots used for fishing hooks in the past (1,2,3).
Amaranthus viridis Linn.	Amaranthaceae	longolongo 'uha	amaranth	young leaves sometimes eaten (1,3,6).
Amorphophallus campanulatus (Roxburgh) Blume	Araceae	teve		tuber eaten in past or in times of food shortage (1,5,6,7).
Anacardium occidentale Linn.	Anacardiaceae	apu	cashew	fruit eaten (1,5,6,7).
Ananas comosus (Linn.) Merrill	Bromeliaceae	fainā	pineapple	ripe fruit eaten raw and used to make alcoholic and non-alcoholic beverages (1,3,6,7).
Annona muricata Linn.	Annonaceae	'apele Tonga	soursop	fruit eaten raw and used to prepare cold beverages; leaves used medicinally (1,2,3,4,5,6,7).

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Appendix B. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Annona reticulata Linn.	Annonaceae	*'apele Palangi*	bullock's heart, custard apple	fruit eaten raw and used to prepare cold beverages (1,3,4,5,6,7).
Annona squamosa Linn.	Annonaceae	*'apele Tonga*	sweet sop	fruit eaten raw and used in the preparation of cold beverages (1,3,4,5,6,7).
Apium graveolens Linn. var. *dulce* c. de Canddlle	Umbelliferae	*selali*	celery	grown primarily for sale to Europeans; eaten by some Tongans (1,3).
Arachis hypogaea Linn.	Leguminosae	*pinati*	peanut	seeds eaten raw and roasted (1,3,5,6,7).
Araucaria excelsa R. Brown	Araucariaceae	*paini*	Norfolk Island pine	planted as an ornamental (1).
Artabotrys uncinatus (Lamarck) Merrill	Annonaceae	*mohokoi Honolulu*		fruit and flowers used for scenting coconut oil (1,3).
Artocarpus altilis (Parkinson) Fosberg	Moraceae	*mei*	bread-fruit	bark used medicinally and as a form of cloth; leaves used to wrap sea food; trunk used in construction

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				of dugout canoes, especially paddles sap used as gum and to calk canoe seams; stamens burned as mosquito repellent; fruit eaten cooked or made into Tongan pudding (1,2,3,4,5,6,7).
Asclepias curassavica Linn.	Asclepiadaceae	tu'ulapepe, vavae kona, laupepe.	milkweed	(1,3).
Asplenium nidus Linn.	Polypodiaceae	hulufe	bird's nest fern	(1,3).
Auricularia polytricha (Montagne) Saccardo	Auriculariaceae	talingelinga	rat's ear fungus	dried and exported to Hongkong (1,3).
Bambusa vulgaris Schrader	Gramineae	pitu, kofe	bamboo	stems use as poles, fences, or in house and house wall construction, as barrels for fireworks and as clothes pins (1,3).
Barringtonia asiatica (Linn.) Kurz	Barringtoniaceae	futu	poison fish tree	nuts and bark used in the preparation of fish poison; timber used for firewood and handicrafts (1,3).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Bauhinia monandra Kurz	Leguminosae	*fehi*	Hong Kong orchid tree	timber used for handicraft, house construction, and banana shooks; trunk used for dugout canoes (1,3,5,7).
Beta vulgaris Linn.	Chenopodiaceae	*pitiluti*	beets, beetroot	eaten occasionally by Tongans; sold at market to Europeans (1,3,7).
Beta vulgaris Linn. var. *cicla* Linn.	Chenopodiaceae		chard, silver beet	eaten occasionally by Tongans; sold at market to Europeans (1,3).
Bidens pilosa Linn.	Compositae	*fisi'uli*		leaves used medicinally (1,2,3,4).
Bikkia tetandra (Forster f.) A. Richard	Rubiaceae	*sialetafa*		(1,3).
Bischofia javanica Blume	Euphorbiaceae	*koka*		bark and leaves used medicinally and to prepare red dye for tapa cloth; leaves cooked with fish in *umu* to soften bones; wood used for handicrafts, firewood and fenceposts (1,2,3).

Appendix B. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Brassica chinensis Juslenius	Cruciferae	kapisi Siaina	Chinese cabbage	leaves cooked as a vegetable occasionally (1,3,7).
Brassica oleracea Linn var. betrylis Linn.	Cruciferae		cauliflower	eaten rarely by Tongans; sold to Europeans (1).
Brassica oleracea Linn. var. capitata Linn.	Cruciferae	kapisi	English cabbage	leaves cooked as a vegetable (1,3,7).
Brassica pekinensis (Loureiro) Rupr.	Cruciferae	kapisi Siaina	Chinese cabbage	leaves cooked as a vegetable (1,3,6,7).
Broussonetia papyrifera (Linn.) Ventenot	Moraceae	hiapo	paper mulberry	inner bark used to make tapa cloth; roots used medicinally (1,2,3,6,7,8).
Bruguiera conjugata (Linn.) Merrill	Rhizophoraceae	tongo, tongota'ane	mangrove	flower used in the preparation of a dye for tapa cloth; wood and roots used as rafters in house construction; wood used for firewood (1,3).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Burkella richii (A. Gray) H.J. Lam	Sapotaceae	*kau*		timber useful for handicrafts such as kava bowls, canoe paddles and *kali*; fruit edible (1,3).
Calophyllum inophyllum Linn.	Guttiferae	*feta'u*		fruit used for scenting coconut oil; oil of seeds and leaves used medicinally; wood used for house construction, kava bowls, ribs and sterns of boats, and horse carts (1,2,3,4).
Cananga odorata (Lamarck) Hooker f. and Thompson	Annonaceae	*mohokoi*	perfume tree	flowers used for leis, other decorations, garlands and for scenting coconut oil; leaves and bark used medicinally; wood for canoe outriggers; timber for general construction purposes (1,2,3,4,8).
Canavalia maritima (Aublet) Thouars	Leguminosae	*lautolu-'uta*		leaves used medicinally (1,2,8).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Canavalia sericea A. Gray	Leguminosae	*fuetahi veveli*		(1,3).
Canna indica Linn.	Cannaceae	*misimisi*		seeds sometimes used in necklaces (1,3).
Canthium barbatum (Forster f.) Seeman	Rubiaceae	*olamaka*		(1,3).
Capsicum annuum Linn.	Solanaceae	*polo*	bell pepper, capsicum	fruit eaten cooked as a vegetable or spice, generally in soups or stews (1,6).
Capsicum frutescens Linn.	Solanaceae	*polo fifisi*	Chile pepper, Tabasco	leaves and fruit used medicinally; fruit used as a spice in cooking and eaten raw on occasions (1,2,3,4,8).
Carica papaya Linn.	Caricaceae	*lesi*	papaya, pawpaw	leaves used to tenderize raw meat and to wrap sea food; the ripe to semi-ripe fruit eaten raw and cooked; the flowers used in leis. (1,3,5,6,7)

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Cassia fistula Linn.	Leguminosae	kasia	golden shower	wood used for handicrafts (1).
Cassia javanica Linn.	Leguminosae	kasia	pink and white shower	wood used for handicrafts (1).
Cassia tora Linn.	Leguminosae	te'epulu, tengafefeka		(1,3).
Cassytha filiformis Linn.	Lauraceae	fatai		used as adornment during picnics (1,3).
Casuarina equisetifolia Linn.	Casuarinaceae	toa	Australian pine, ironwood	bark used medicinally; wood used for tool handles, for general construction and wood carving (1,2,3,4).
Cedrela odorata Linn.	Meliaceae	sita Palangi	West Indian cedar	timber for general construction (1).
Ceiba pentandra (Linn.) Gaertner	Bombaceae	vavae	kapok	silky seed fibers used as filler for pillows, mattresses, etc.; trees used to mark boundaries in bush; wood used for various purposes (1,3).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Cenchrus echinatus Linn.	Graminae	hefa		(1,3).
Centella asiatica (Linn.) Urban	Umbelliferae	tono		leaves used medicinally (1,2,3,4,8).
Cerbera manghas Linn.	Apocynaceae	toto		leaves and bark used medicinally; flowers used for leis and other decorations; timber used for general construction and handicrafts; trunks used for dugout canoes (1,2,3,8).
Cinnamomum sp.	Lauraceae	sinamoni	cinnamon	leaves used in scenting coconut oil; timber used occasionally for general construction (1).
Citrullus vulgaris Schrader	Cucurbitaceae	meleni	watermelon	fruit eaten raw and used to make cold beverages (1,3).
Citrus aurantifolia (Christm.) Swingle	Rutaceae	laimi	lime	juice of fruit used to marinate raw fish and in the preparation of beverages. (1,6,7)

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Citrus aurantium Linn.	Rutaceae	moli mahi	sour orange	fruit eaten and juice used in the preparation of cold beverages (1,6,7).
Citrus limon (Linn.) Burmann f.	Rutaceae	lemani	lemon	juice of fruit used medicinally to marinate raw fish and in the preparation of beverages; leaves boiled in the preparation of tea; wood occasionally used as firewood (1,6,7).
Citrus maxima (Burmann) Merrill	Rutaceae	moli Tonga	pomelo	Fruit eaten raw; rind used to make children's toys; bark used medicinally; wood used as firewood (1,2,3, 6,7,8).
Citrus medica Linn.	Rutaceae	kola	citron	fruit used for making cold beverages; bark used medicinally (1,2,6,7).
Citrus reticulata Blanco	Rutaceae	molipele	tangerine, mandarin	fruit eaten raw; bark used medicinally (1,2,7).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Citrus sinensis (Linn.) Osbeck	Rutaceae	*moli*	orange	leaves and bark used medicinally; fruit eaten raw and used in preparation of cold beverages; leaves used in preparation of tea; flowers used to make leis; *sisis*; wood occasionally used for firewood (1,2,6, 7,8).
Citrus spp.	Rutaceae	*moli vai keli*		fruit eaten (1).
Clerodendrum inerme (Linn.) Gaertner	Verbenaceae	*tutuhina*		bark used medicinally (1,2,3,4).
Cocos nucifera Linn.	Palmae	*niu*	coconut palm	roots used for fish traps; trunk used for house posts; timber used in general construction and handicrafts; leaves used for weaving mats, baskets, roofing and other plaited ware; water inside nuts is major form of refreshment; endosperm is used in the preparation of copra, oil, coconut cream used in cook-

Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				ing, for fishing bait, and for animal feed; the shell is used for drinking cups and other utensils; husk is used as corks and cordage and for straining coconut cream, etc.; husk and dried husk of some varieties used medicinally (1,5,6,7,8).
Codiaeum variegatum (Linn.) Blume	Euphorbiaceae	uhi palangi	croton	ornamental plant, often in cemeteries (1,3).
Coffea arabica Linn.	Rubiaceae	kofi	coffee	used to brew coffee; roasted locally (1,3).
Coix lachryma-jobi Linn.	Gramineae	hana	Job's tears	seeds used as beads in making leis and for other ornamentation (1,3).
Coleus amboinicus Loureiro	Labiatae	kaloni		leaves used to scent coconut oil and in wash water to perfume clothing; also used as Tongan perfume (1,3).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Colocasia esculenta (Linn.) Schott	Araceae	*talo Tonga*	taro, swamp taro	corm eaten cooked as a staple vegetable; leaves cooked, as a green vegetable (1,3,5,6,7).
Colubrina asiatica (Linn.) Brongniart	Rhamnaceae	*fiho'a*		bark and leaves used as a soap and shampoo substitute; bark and leaves also used medicinally (1,2,3).
Commelina benghalensis Linn.	Commelinaceae	*kaningi*		(1,3).
Commelina diffusa Burmann f.	Commelinaceae	*kaningi*		(1,3).
Cordia subcordata Lamarck	Boraginaceae	*puataukanave*		trunk used for house construction; wood is prized for wood carving (1,3).
Cordyline terminalis (Linn.) Kunth	Liliaceae	*si*	cabbage tree	leaves used medicinally and to wrap fish and sea food; roots of some varieties eaten after extended cooking; leaves made into skirts for traditional dances (1,2,3,4,6,7).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Crinum asiaticum Linn.	Amaryllidaceae	*samoa*		planted as hedges or borders (1,3).
Crotalaria mucronata Desvaux	Leguminosae	*piisi*, *piini*		introduced fallow plant (1).
Cucumis melo Linn. var. *cantalupensis* Naude.	Cucurbitaceae	*meleni maka*	rock melon	eaten occasionally (1).
Cucumis sativus Linn.	Cucurbitaceae	*kiukumipa*	cucumber	fruit eaten raw at feasts; sold at market and shipped to New Zealand (1,3,5,6,7).
Cucurbita pepo Linn.	Cucurbitaceae	*hina*	pumpkin	fruit cooked as a staple substitute; leaves occasionally cooked as green vegetable (1,3,6,7).
Curcuma longa Linn.	Zingiberaceae	ango, *angoenga*	turmeric	rhizome used medicinally and in the preparation of yellow dye; leaves used medicinally and for wrapping fish while cooking (1,2,3,4,6,7,8).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Cymbopogon citratus (c. de Candolle ex Nees)Stapf.	Gramineae	moengālō	lemon grass	leaves used to make tea; roots used to scent coconut oil (1,9).
Cycas circinalis Linn.	Cycadaceae	longolongo	cycad	seeds eaten occasionally as a starch after thorough preparation; leaves used as decoration (1,3,5,7).
Cyperus compressus Linn.	Cyperaceae	pakopako, pakopako 'ano		(1,3).
Cyperus javanicus Houttuyn	Cyperaceae	mahelehele		(1,3).
Cyperus rotundus Linn.	Cyperaceae	pakopako	nut sedge	roots used as a soap substitute and chewed together with candlenut (1,3).
Cyrtosperma chamissonis (Schott) Merrill	Araceae	via		eaten in times of food shortage if available (1,3,5,6,7).
Daucus carota Linn.	Umbelliferae	kaloti	carrot	eaten as a cooked vegetable in soups and stews; sold at market (1,3,6,7).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Decaspermum fruticosum J.R. and G. Forster	Myrtaceae	nukonuka		leaves and bark used medicinally and to scent Tongan oil (1,2,3).
Delonix regia (Boger) Rafinesque	Leguminosae	'ohai	flamboyant, poinciana	seeds eaten occasionally (1,3,6).
Derris elliptica (Roxb.) Bentham	Leguminosae	kava Fisi, kava'aukava		extracts of roots used for stupefying and poisoning fish (1,3,5).
Derris trifoliata Loureiro	Leguminosae	kava'aukava, kavahaha		extract of roots used as a fish poison; stem fibers used as cordage (1,3).
Desmodium umbellatum (Linn.) de Candolle	Leguminosae	lala tahi		(1,3).
Digitaria pruriens (Trinius) Buese	Gramineae	mohuku'apopoa		(1,3).
Dioscorea alata Linn.	Dioscoreaceae	'ufi	yam, greater yam	cooked tubers are the most prized of Tongan staples (1,3,5,6,7).
Dioscorea bulbifera Linn.	Dioscoreaceae	hoi		eaten only in times of famine and only when properly cooked (1,3,5,6,7).

Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Dioscorea esculenta (Loureiro) Burkill	Dioscoreaceae	*'ufilei*	goa yam, sweet yam	cooked tuber eaten as a staple (1,3,5,6,7).
Diospyros ferrea (Willdenow) Bakhuizen	Ebenaceae	*kanume*		fruit occasionally eaten; bark used medicinally; timber used for fenceposts, handicrafts and firewood (1,2,3,4,8).
Diospyros laterifolia (Hiern) Bakhuizen	Ebenaceae	*mapa*		fruit used in making leis and scenting coconut oil; leaves and bark used medicinally (1,2,3,8).
Dolichos lablab Linn.	Leguminosae	*pini Tonga*, *pini fakalelei 'ae kelekele*, *pini 'ae puaka*	hyacinth bean	pods eaten occasionally in times of food shortage; planted to improve soil fertility (1,3,5,6,7).
Dryopteris invisa (Forster f.) O. Kuntze	Polypodiaceae	*hulufe*		(1,3).
Duranta repens Linn.	Verbenaceae	*'olive*		leaves used as decorations. (1,3).
Dysoxylum forsteri (Jussieu) c. de Candolle	Meliaceae	*mo'ota*		leaves and bark used medicinally; trunk used for

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				dugout canoes; timber used for handicrafts, general construction and banana shooks (1,2,3,4).
Elaeocarpus tonganus Burkill	Elaeocarpaceae	ma'ama'alava		timber used for general construction (1,3).
Elattostachys falcata (Seeman) Radlkofer	Sapindaceae	ngatata		bark used medicinally; timber used for general construction, especially for fenceposts, tapa beating boards, banana shooks, and handicrafts; wood makes excellent firewood (1,2,3).
Eleocharis dulcis (Burmann) Trinius	Cyperaceae	kuta	water chestnut	stems used for weaving mats (1,3).
Elephantopus mollis H.B.K.	Compositae			(1,3).
Emilia sonchifolia (Linn.) de Candolle	Compositae	fisipuna		(1,3).
Entada phaseoloides (Linn.) Merrill	Leguminosae	valai, sipi		vine used medicinally; seeds used in making necklaces and other decorations

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				(1,3,8).
Epipremnum pinnatum (Linn.) Engler	Araceae	alu		stems used in making prized baskets (1,3).
Erigeron sumatrensis Retzius	Compositae	fisipuna		(1,3).
Ervatamia orientalis (R. Brown) Turrill	Apocynaceae	te'ete'emanu		roots and bark used medicinally; wood used for firewood (1,2,3,4).
Erythrina variegata Linn. var. orientalis (Linn.) Merrill	Leguminosae	ngatae	coral tree, tiger's claw	leaves and bark used medicinally; trunk used for dugout canoes; stems used as living fenceposts; trees used to mark property lines (1,2,3,4,8).
Eucalyptus spp.	Myrtaceae	pulukamu	gum tree, eucalyptus	introduced as a timber tree for reforestation (1,3).
Euphorbia atoto Forster f.	Euphorbiaceae	ngingie uta, kavahuhu, lalahi, kavahuhu tahi		(1,3).
Euphorbia hirta Linn.	Euphorbiaceae	sakisi		(1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Euphorbia pulcherrima Willdenow	Euphorbiaceae	fe'ofa'aki	poinsettia	planted as an ornamental. (1,3).
Evodia hortensis J.R. and G. Forster f. hortensis	Rutaceae	sipaisi		leaves used for scenting coconut oil. (3).
Evodia hortensis J.R. and G. Forster f. simplicifolia (Rechinger) K. Schum	Rutaceae	uhi		leaves and bark used medicinally. (1,2,3,4,8).
Excoecaria agallocha Linn.	Euphorbiaceae	feta'anu		leaves used medicinally; timber used for general construction purposes. (1,2,3).
Fagraea berteriana A. Gray	Loganiaceae	pua Tonga, pua		flowers used in leis and for scenting coconut oil; leaves and bark used medicinally; wood useful for different purposes such as making horse carts. (1,2,3,8).
Ficus benjamina Linn.	Moraceae	'ovava Fisi	weeping fig	used as shade tree. (1,9).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Ficus carica Linn.	Moraceae	*fiki kai*	fig	fruit eaten. (1,3).
Ficus obliqua Forster f.	Moraceae	*'ovava*	strangler fig	bark and leaves used medicinally. (1,2,3,4,8).
Ficus scabra Forster f.	Moraceae	*masi'ata*		leaves and bark used medicinally; horses eat young leaves; wood used as firewood. (1,2,3).
Ficus tinctoria Forster f.	Moraceae	*masi'ata*		(3).
Fimbristylis cymosa R. Brown	Cyperaceae	*pako, pako failolo*		root nodules used to scent coconut oil. (1,3).
Fragaria ananassa Linn.	Rosaceae		strawberry	
Garcinia sessilis (Forster) Seeman	Guttiferae	*heilala*		flowers used for scenting coconut oil and in making leis; and garlands; leaves used medicinally. (1,2,3,8)
Gardenia jasminoides Ellis	Rubiaceae	*sialemata-lateau*	gardenia	flowers used for leis and other decorations and for scenting coconut oil; bark

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				and roots used medicinally (1,2,3,8).
Gardenia taitensis c. de Candolle	Rubiaceae	*siale Tonga*	gardenia	flowers used for leis and other decorations and for scenting coconut oil; bark used medicinally (1,2,3,4,8).
Garuga floribunda Decaisne	Burseraceae	*manaui*		timber used for general construction, for dugout canoes, and wood carving; bark used in the preparation of black dye for pandanus leaves; often planted along property boundaries as a living fence (1,3).
Geniostoma rupestre J.R. and G. Forster	Loganiaceae	*te'epilo-'amaui*		bark and flowers used medicinally (1,2,3,8).
Glochidion concolor Mueller-Argoviensis	Euphorbiaceae	*malolo, masikoka*		bark and leaves used medicinally; wood for firewood (1,2,3,8).
Glochidion ramiflorum Forster f.	Euphorbiaceae	*malolo, masikoka*		bark and leaves used medicinally; wood for firewood

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				(1,2,3,4,8).
Gossypium brasiliense Macfayden	Malvaceae	*vavae Tonga*	cotton	used to fill pillows and mattresses (1,3).
Grevillea robusta A. Cunn	Proteaceae	*oke*	silky oak	used for timber and firewood (1,9).
Grewia crenata J.R. and G. Forster	Tiliaceae	*fo'ui*		leaves and bark used medicinally; bark fiber used for cordage, timber used for banana shooks and general construction; wood used as firewood (1,2,3).
Guettarda speciosa Linn.	Rubiaceae	*puopua*		flowers sometimes used in leis and *sisis*; flowers and leaves used to scent coconut oil; bark used medicinally; timber good for general construction, banana shooks, tapa beating boards, and firewood (1,2,3).
Gymnosporia vitiensis (A. Gray) Howard	Celastraceae	*olomaka*		branches used in making chairs (1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Gyrocarpus americanus Jacquin	Hernandiaceae	puko, puko-vili		leaves and bark used medicinally; tree used for dugout canoes and house construction (1,2,3,4).
Hedychium coronarium Koenig	Zingiberaceae	tevunga		leaves and roots used to scent coconut oil (1,3).
Heritiera littoralis Dryander	Sterculiaceae	'ifitahi, mamea		timber useful for general construction (1,3).
Hernandia moerenhoutiana Guillemin	Hernandiaceae	pipitui, pipi		fruit and flowers used for making leis and other decorations and for scenting coconut oil; leaves, bark and flowers used medicinally; wood used for general construction purposes; trunk used for dugout canoes (1,2,3,4).
Hernandia ovigera Linn.	Hernandiaceae	fotulona		seeds used for making necklaces; trunks used for dugout canoes; timber used for general construction and banana shooks (1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Hibiscus abelmoschus Linn.	Malvaceae	loa		fruit used to prepare a red dye for tapa making; various parts used medicinally (1,2).
Hibiscus esculentus Linn.	Malvaceae		okra	eaten occasionally by Tongans; sold at market (1,6,7,9).
Hibiscus manihot Linn.	Malvaceae	pele	edible hibiscus	leaves cooked as a green vegetable (1,3,6,7).
Hibiscus rosa-sinensis Linn.	Malvaceae	kaute	hibiscus	flowers used for decorative purposes and as hedgerows; browse for livestock (1,3)
Hibiscus sabdariffa Linn.	Malvaceae	lasipeli	roselle	ripe calyx used for making jam or stewed fruit (1,6,7,9).
Hibiscus schizopetalus (Masters) Hooker f.	Malvaceae	kaute	hibiscus	flowers used for decorative purposes and as hedgerows; browse for livestock (1,3).
Hibiscus tiliaceus Linn.	Malvaceae	fau	hibiscus tree	bark and young leaves used medicinally; inner bark used as cordage for rope,

Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				ta'ovalas, skirts kava strainers, etc.; wood used for general construction purposes, especially for house poles, fence posts; and sometimes for wood carving; leaves used to wrap sea food (1,2,3,4).
Homalanthus nutuns (Forster) Pax	Euphorbiaceae	*melamala'a-fonua*, *fonua malamala*		(1,3).
Hoya australis R. Brown	Asclepiadaceae	*matolu*, *laumatolu*		leaves and stems used medicinally; flowers sometimes used for leis (1,3,4).
Indigofera suffruticosa Miller	Leguminosae	*'akauveli*	indigo	leaves used medicinally (1,3,8).
Inocarpus edulis J.R. and G. Forster	Leguminosae	*ifi*	Tahitian chestnut	seeds cooked and eaten; leaves and bark are used medicinally; the hard wood is used for tool handles, kava bowls, tapa pounders, banana shooks, and firewood (1,2,3,4,5,6,7,8).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Ipomoea angulata Lamarck	Convolvulaceae	fue kula	morning-glory	leaves used medicinally (1,2).
Ipomoea batatas (Linn.) Poiret	Convolvulaceae	kumala	sweet potato	tubers cooked and eaten as a staple vegetable; leaves cooked as a green vegetable; raw leaves fed to livestock, especially pigs (1,3,5,6,7,).
Ipomoea cairica (Linn.) Sweet	Convolvulaceae	fue vaaleti	morning-glory	(1,3).
Ipomoea congesta R. Brown	Convolvulaceae	fue, fue 'ae kuma, fue 'ae puaka	morning-glory	roots, stems and leaves used medicinally (1,2,3,4)
Ipomoea gracilis R. Brown	Convolvulaceae	fue	morning-glory	(1,3).
Ipomoea pes-caprae (Linn.) Sweet	Convolvulaceae	fue tahi	beach morning-glory	(1,3).
Ischaemum murinum Forster f.	Gramineae	totoa		(1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Jasminum didymum Forster f.	Oleaceae	*tutu'uli*		leaves and bark used medicinally; juice of fruit used as an ink substitute; bark used to lash fences; wood used as firewood (1,2,3,4,8).
Jasminum simplicifolium Forster f.	Oleaceae	*tutu'uli*		leaves and bark used medicinally; juice of fruit used as an ink substitute; bark used to lash fences; wood used as firewood (1,2,3,4,8).
Jatropha curcas Linn.	Euphorbiaceae	*fiki*	physic nut	leaves used medicinally; planted as living fence posts; plants used as supports for vanilla vines (1,2,3,4,5,8).
Jussiaea erecta Linn.	Onagraceae	*loa ano*, *lotokai ano*		stems and leaves used to produce a black dye for pandanus weaving (1,3).
Kyllinga monocephala Rottböll	Cyperaceae	*pakopako*, *pakopako 'ae kuma*		(1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Lactuca sativa Linn.	Compositae	letisi	lettuce	leaves are eaten (1).
Lantana camara Linn. var. aculeata (Linn.) Moldenke.	Verbenaceae	talatala	lantana	leaves used medicinally; branches used to support yams (1,2,3,4).
Leucaena leucocephala (Lam.) DeWit.	Leguminosae	sialemohemohe		leaves used as livestock feed; strong stems used for fences, house construction and as a major source of firewood (1,3).
Leucaena insularum (Guillemin) Daniker.	Leguminosae	mohemohe		wood used in handicraft work (1,3).
Lumnitzera littorea (Jack) Voigt.	Combretaceae	hangale		flowers used in leis, garlands and other decorations; wood used for firewood (1,3).
Lycopersicon esculentum Miller.	Solanaceae	temata	tomato	fruit cooked as vegetable in soups and stews; eaten and used raw as plate decorations at feasts; sold at market and exported overseas (1,3,5,6,7).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Lycopersicon esculentum Miller var. *cerasiforme* (Dunal) Alefeld	Solanaceae	*temata vao*	wild tomato	eaten raw and cooked in soups and stews (1,3,6,7).
Macadamia tetraphylla Johnson	Proteaceae		macadamia nut	fruit eaten roasted (1).
Macaranga harveyana (Mueller-Argoviensis) Mueller-Argoviensis	Euphorbiaceae	*loupata*		roots, bark and leaves used medicinally; leaves used for wrapping seafood and fish and for covering underground oven; timber used for house construction, canoe paddles, handicraft work, banana shooks, and firewood (1,2,3,4).
Malus pumila Miller	Rosaceae	*'apele*, *'apele Palangi*	apple	fruit eaten raw (1).
Mangifera indica Linn.	Anacardiaceae	*mango*	mango	timber used for firewood, handicrafts, especially kava bowls; trunk for dug-out canoes, fruit eaten raw, both when green and

Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				when ripe; leaves and bark used medicinally (1,2,3, 5,6,7).
Manihot esculenta Crantz	Euphorbiaceae	manioke	cassava, manioc, tapioca	tubers cooked as a staple vegetable, grated and made into starch, grated and boiled to make fai kakai (Tongan pudding) and used to prepare paste for the tapa making process; leaves boiled and eaten as a green vegetable; tubers often used as food for livestock (1,3,5,6,7).
Maranta arundinacea Linn.	Marantaceae	misimisi koka'anga	arrowroot	rootstalks used to prepare paste for tapa making process and is eaten on rare occasions (1,3).
Melia azedarach Linn.	Meliaceae	sita		wood used in some handicraft work (1,3).
Melinis minutiflora Beauvois	Gramineae	puakatau	molasses grass	introduced fodder grass (1,3,9).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Mertya macrophylla (Richard) Seeman	Araliaceae	kulukulu		leaves used to wrap fish (1,3).
Micromelum minutum (Forster f.) Seeman	Rutaceae	takafalu		leaves and bark used medicinally (1,2,3).
Mimosa pudica Linn.	Leguminosae	mateloi	sensitive plant	(1,3).
Miscanthus floridulus (Labillardiere) Warburg	Gramineae	kaho	sword grass	stems used for construction of house walls and handicraft (1,3).
Momordica charantia Linn.	Cucurbitaceae	meleni 'ae kuma, siamu 'ae kuma	balsam vine	fruit edible (1,3,5,6,7).
Morinda citrifolia Linn.	Rubiaceae	nonu	Indian mulberry	fruit eaten by elderly Tongans; leaves, fruit, bark and roots used medicinally; roots and bark produce yellow and red dyes respectively, used to color ta'o vala; wood used as firewood (1,2,3,4,5,6,7,8).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Morus alba Linn.	Moraceae	fuamelie	mulberry	fruit edible (1,3).
Musa diploid clone probably derived from M. acuminata x M. balbisiana (AB)	Musaceae	misapeka*	lady finger	fruit eaten ripe (1,3,9).
Musa paradisiaca Linn. Binomial conventionally applied to group of starchy triploid clones derived from M. acuminata x M. balbisiana (AAB).	Musaceae	hopa*	plantain	fruit cooked green as a vegetable, eaten ripe(raw) as a fruit and often fed ripe to stock; leaves used as table covers or plates at feasts, to wrap food in when cooked in the umu (underground oven(1,3,6,7).
Musa sapientum Linn. Binomial conventionally but inaccurately applied to group of non-starchy triploid clones derived from M. acuminata (AAA).	Musaceue	siaine, pata, mamae* *all Musa spp. are collectively referred to as fusi	banana	fruit cooked green as a vegetable or eaten ripe (raw) as a fruit and often fed ripe to stock; leaves used to wrap food while cooking in umu, to cover umu, and as table covers or plates; trunks, fruit and leaves used medicinally (1,2,3,6,7,8).
Myristica hypargyraea A. Gray	Myristicaceae	kotone	nutmeg	fruit and flowers used in leis and sisis; aril used

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				for ornamentation; timber good for general construction and banana shooks (1,3).
Nephrolepis hirsutula (Forster f.) Presl	Polypodiaceae	hulufe		parts of plant used medicinally. (1,2,3)
Nerium oleander Linn.	Apocynaceae	lolie	oleander, nerium lily	(1,3).
Nicotiana fragrans Hook	Solanaceae	tapaka Tonga	wild tobacco	leaves used medicinally and dried and cured for chewing or smoking (1,2,3).
Nicotiana tabacum Linn.	Solanaceae	tapaka	tobacco	leaves used medicinally and dried and cured for chewing or smoking (1,2,3).
Nothopanax fruticosum (Linn.) Miquel	Araliaceae	tanetane		planted as hedgerows or living fences; browse for livestock (1,3).
Nothopanax guilfoylei (Cogniaux and Marche) Merrill	Araliaceae	tanetane		planted as hedgerows or living fences; browse for livestock (1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Ochrosia oppositifolia (Lamarck) K. Schumann	Apocynaceae	fao		seeds are often eaten; leaves used to wrap fish or sea food; timber used for handicrafts and general construction; trunk used for dugout canoes (1,3,6).
Oplismenus compositus (Linn.) Beauvois	Gramineae			(1,3)
Oxalis corniculata Linn.	Oxalidaceae	kihikihi		leaves used medicinally (1,2,3,4).
Pandanus tectorius* (Solander) Pakinson	Pandanaceae	fā	screw pine	fruit eaten occasionally; seed used to make leis, sisi and other decoration; leaves used for plaited ware such as baskets,mats, etc.; flower and seeds of some varieties used for scenting Tongan oil;roots and young shoots used medicinally; wood sometimes used in the construction of houses (1,2,3,5,6,7,8).
*the following varieties were listed by Yuncker:				
P. corallinus Martelli	Pandanaceae	fā kula		
P. odoratissimus Martelli var. pseudo-linnaei Martelli	Pandanaceae	fā hina		

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
P. *odoratissimus* Martelli var. *pyriformis* Martelli	Pandanaceae	*fā vula*		
P. *odoratissimus* Martelli var. *sinensis* Warburg	Pandanaceae	*falahola*		
P. *whitmeeanus* Martelli	Pandanaceae	*paongo*		
Panicum maximum Jacquin	Gramineae	*saafa*	Guinea grass	good forage grass (1,3).
Parinarium glaberrimum Hasskarl	Rosaceae	*pipi*, *pipi failolo*		seeds used for scenting oil, wood makes excellent kumetes; wood used as firewood (1,3).
Parinarium insularum A. Gray	Rosaceae	*hea*		fruit used in scenting oil and for making leis and sisis (1,3).
Paspalum conjugatum Berger	Gramineae	*vailima*		(1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Passiflora edulis Sims	Passifloraceae	vaine Tonga	passion-fruit	seeds of fruit eaten and used in preparation of cold beverages(1,3,6,7).
Passiflora foetida Sims	Passifloraceae	vaine 'ae kuma		fruit eaten when available (1,3,6,7).
Passiflora maliformis Linn.	Passifloraceae	vaine kai, vaine kili fefeka	wild passion-fruit	seeds of fruit eaten occasionally (1,3,6).
Passiflora quadrangularis Linn.	Passifloraceae	pasione	granadilla	seeds of fruit eaten and used to prepare cold beverages (1,3,6,7).
Passiflora subpeltata Ortega	Passifloraceae	vaine 'ae kuma		(1,3).
Pemphis acidula J.R. and G. Forster	Lythraceae	ngingie		(1,3,5).
Persea americana (Linn.) Miller	Lauraceae	'avoka	avocado	fruit eaten ripe and used as a butter substitute (1,3,6,7).
Phaleria disperma (Forster f.) Baillon	Thymelaeaceae	huni		flowers and leaves used for leis, garlands and

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				other decoration; leaves used medicinally (1,2,3).
Phaseolus semierectus Linn.	Leguminosae	piini, piini kulokula		(1,3).
Phaseolus vulgaris Linn.	Leguminosae	piini	French bean, green bean	fruit eaten cooked in stews and soups (1,3,6,7).
Physalis angulata Linn.	Solanaceae	polo pa		leaves used medicinally (1,3,4).
Piper methysticum Forster f.	Piperaceae	kava		leaves used medicinally; roots pulverized in the preparation of beverage known as kava (1,2,3,4,6,7,8).
Piper puberulum (Bentham) Bentham var. glabrum (de Candolle) A.C. Smith	Piperaceae	kavakava-'ulie		leaves and stems used medicinally (1,2,3,4,8).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Pipturus argenteus (Forster f.) Waddell var. lanosus Skottsberg	Urticaceae	tou, olonga		leaves and bark used medicinally; bark source of cordage fiber (1,3,4).
Pisonia grandis R. Brown	Nyctaginaceae	fotulona, pukovai		bark used medicinally (1,3,4).
Pisum sativum Linn.	Leguminosae	piisi	garden pea	seeds cooked green as a vegetable (1,3,6,7).
Pittosporum arborescens Rich	Pittosporaceae	masi'aukava, masi, masi kona		fruit used in the preparation of fish poison; leaves and bark used medicinally; wood used for firewood (1,2,3).
Planchonella costata (Endlicher) Pierre var. vitiensis H.J. Lam	Sapotaceae	kalaka		timber used for handicrafts and general construction purposes (1,3).
Plantago major Linn.	Plantaginaceae	filo		(1,3).
Pleiogynium solanderi (Bentham) Engler	Anacardiaceae	tangato		fruit is edible; timber used for handicrafts, dugout canoes, and other

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				purposes (1,3).
Plumeria acuminata Alton	Apocynaceae	*kalosipani*	*frangipani*, plumeria	flowers used in leis and other decorations and for scenting coconut oil; wood used for making diving goggles (1,3).
Plumeria rubra Linn.	Apocynaceae	*kalosipani*	frangipani, plumeria	flowers used in leis and other decorations (1,3).
Pogostemon nepetoides Staph.		*pasiole*		(1).
Polypodium scolopendria Burmann f.	Polypodiaceae	*laufale*		leaves and bark used medicinally (1,2,3,4).
Pometia pinnata J.R. and G. Forster.	Sapindaceae	*tava*	wild liichi	fruit eaten ripe; bark and leaves used medicinally; timber used for house construction, tapa beaters, dugout canoes, banana shooks, and firewood (1,2,3,4,6,7,8).
Portulaca oleracea	Portulacaceae	*tamole*	common purslane	leaves and stems edible, but rarely eaten (1,3,5).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Portulaca samoensis	Portulacaceae	kihikihi ngingie		(1,3).
Premna taitensis Shaver var. rimitarensis F.B.H. Brown	Verbenaceae	volovalo		leaves and bark used medicinally; wood used for carving and firewood (1,2,3,4).
Pritchardia pacifica Seeman and Wendland	Palmae	piu		fruit are eaten occasionally; leaves used to prepare tobacco and to make fans; wood used to make house frames (1,3).
Prunus persica Stakes	Rosaceae	piisi	peach	fruit are eaten (1,3).
Psidium guajava Linn.	Myrtaceae	kuava	guava	fruit and seed are eaten raw; leaves and bark used medicinally; makes excellent charcoal (1,2,3,4,5,6,7).
Pueraria lobata (Willdenow) Ohwi	Leguminosae	aka	kudzu vine	parts used medicinally; eaten in time of food shortage; good pig feed (1,2,3,4,6,7).

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Scientific Name	Family	Tongan (Name(s)	English Name(s)	Uses
Raphanus sativus Linn.	Cruciferae	*latisi*	radish	rarely eaten by Tongans; sold at market primarily to Europeans (1,3,6,7).
Rhaphus aciculata (Retzius) Desvaux	Gramineae	*matapekepeka*		(1,3).
Rhizophora mangle Linn.	Rhizophoraceae	*tongo*, *tongo-lei*	mangrove	bark used in the preparation of dye and varnish for the tapa making process; durable wood used in many ways and is the major source of firewood; roots and timber used in house construction (1,3).
Rhizophora mucronata Lmarck	Rhizophoraceae	*tongo*	mangrove	bark used in the preparation of dye and varnish for the tapa making process; durable wood used in many ways; roots and timber used in house construction; major source of firewood (1,3).

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Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Rhus taitensis Guillemin	Anacardiaceae	tavahi		leaves and bark used medicinally; timber used for general construction, banana shooks, and firewood (1,2,3,4).
Rhynchelytrum repens (Willdenow) C.E. Hubbard	Gramineae	salāpona	Natal grass	(1,3).
Ricinus communis Linn.	Euphorbiaceae	lepo	castor bean	bark and stems used medicinally (1,3,4,5).
Saccharum officinarum Linn.	Gramineae	tō	sugar cane	stems are chewed; leaves of a variety used for roof construction (1,3,7,8).
Salix babylonica Linn.	Salicaceae	uilou	willow	leaves and branches used for decoration (1,3).
Samanea saman (Jacquin) Merrill	Leguminosae	kasia	rain tree	excellent wood for carving, especially for kava bowls, and for general construction (1,9).
Santalum yasi Seeman	Santalaceae	ahi	sandalwood	wood used as an incense, burned as a mosquito repellent and powdered for use in scenting coconut

Appendix E. Continued.

Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				oil (1,3).
Scaevola frutescens (Miller) Krause var. frutescens	Goodeniaceae	ngahu		bark and stems used medicinally (1,2,3).
Sesuvium portulacastrum (Linn.) Linn.	Aizoaceae	kihikihimaka		(1,3).
Sida rhombifolia Linn.	Malvaceae	te'ehoosi		bark and stems chewed to clean teeth (1,3).
Sorghum halepense (Linn.) Persoon	Gramineae	kola	Johnson grass	(1,3).
Solanum melongena Linn. var. esculentum Nees	Solanaceae	paengane	eggplant	fruit cooked occasionally in stews, soups or curries by Tongans (1,3,6,7).
Solanum nigrum Linn.	Solanaceae	polo kai	cape gooseberry	leaves cooked as a green vegetable (1,3,5,6,7).
Solanum torvum Swartz	Solanaceae	tisaipale	prickly solanum	(1).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Solanum tuberosum Linn.	Solanaceae	pateta	potato	tuber cooked as a starchy vegetable (1,3).
Solanum uporo Dunal	Solanaceae	polo Tonga		leaves used medicinally (1,2,3,4,8).
Solanum verbascifolium Linn. var auriculatum (Aiton) Kuntz	Solanaceae	pula		(1,3).
Sonchus oleraceus Linn.	Compositae	longolongo 'uha	sow-thistle	leaves cooked as a green vegetable (1,3,6,7).
Sophora tomentosa Linn.	Leguminosae	lata		(1,3).
Spathodea campanulata Beauvois	Bignoniaceae	tiulipe	African tulip tree	(1,3).
Spinifex littoreus (Burmann f.) Merrill	Gramineae	toto'atahi		(1,3).
Spondias dulcis Parkinson	Anacardiaceae	vi	Polynesian vi-apple, Polynesian plum	fruit eaten raw; leaves boiled and eaten as a green vegetable; leaves and bark used medicinally; trunk used for

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				dugout canoes; timber used for general construction purposes (1,2,3,4,6,7).
Stachytarpheta urticaefolia (Salisbury) Sims	Verbenaceae	iku'ikumā	blue rattail	(1,3).
Suriana maritima Linn.	Simaroubaceae	ngingie		(1,3).
Synedrella nodiflora (Linn.) Gaetner	Compositae	pakaka		(1,3).
Syzygium aromaticum Merrill and L. and M. Perry	Myrtaceae	sipaisi	clove	leaves and fruit uses for scenting coconut oil (1).
Syzygium clusiaefolium (A. Gray) C. Mueller	Myrtaceae	fekika vao		fruits and bark used medicinally and for leis and other ornamentation; wood used for general construction, especially for fenceposts (1,2,3,8).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Syzygium corynocarpium (A. Gray) C. Mueller	Myrtaceae	*hehea*		leaves and bark used medicinally; fruit eaten and used in making leis and garlands; timber used for general construction (1,2,3,4,8).
Syzygium jambos (Linn.) Alston	Myrtaceae	*fekika Palangi*	rose apple	fruit eaten (1,3,5,6).
Syzygium malaccense (Linn.) Merrill and Perry	Myrtaceae	*fekika kai*	Malay apple	fruit edible; bark and leaves used medicinally; timber used for general construction (1,3,4,5).
Syzygium neurocalyx (A. Gray) Christophersen	Myrtaceae	*koli*		fruit used in leis; bark used medicinally with lemon (1,2,3).
Syzygium richii (A. Gray) Merrill and Perry	Myrtaceae	*heavula*		timber used for handicrafts (1,3).
Tamarindus indica Linn.	Leguminosae	*tamaline*	tamarind	pulpy part of fruit pod is edible (1,3,5,6,7).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Tacca leontopetaloides (Linn.) O. Kuntze	Taccaceae	*mahoa'a* *Tonga, mahoa'a*	Polynesian arrowroot	tubers furnish a paste used as an adhesive in the manufacture of tapa cloth; grated and made into edible starch and pudding at times (1,3,5,6,7).
Tarenna sambucina (Forster f.) Durand	Rubiaceae	*manonu*		bark and roots used medicinally (1,2,3,4,8).
Terminalia catappa Linn.	Combretaceae	*telie*	Indian almond	seeds edible; bark and leaves used medicinally; trunk used for dugout canoes; timber used for general construction, handicrafts, kava bowls, and banana shooks (1,2,3,4,5,6,7).
Theobroma cacao Linn.	Sterculiaceae	*koko*	cacao	seeds eaten raw and dried to make warm chocolate beverage (1,3,9).
Thespesia populnea (Linn.) Solander	Malvaceae	*milo*		bark, leaves and fruit used medicinally; timber takes a good polish and is used for handicrafts

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
				and general construction (1,2,3,4,8).
Thuarea involuta (Forster) Roemer and Schultes	Gramineae	*musie liku*, *kefukefu*		(1,3).
Thunbergia erecta (Bentham) T. Anders.	Acanthaceae	*paipa*		used for hedges (1).
Thunbergia fragrans Roxburg	Acanthaceae	*fue hina*		(1,3).
Tournefortia argentea (Linn f.) Fosberg	Boraginaceae	*touhuni*	beach helio-trope	leaves used medicinally; used as firewood; fruit used as "peas" in pea shooters by Tongan children. (1,2,3,5).
Trema orientalis (Linn.) Blume var. *viridis* Lauterbach	Ulmaceae	*mangele*		leaves and bark used medicinally; light wood used for floats on fishing nets and for firewood (1,2,3,4,8).
Triumfetta bartramia Linn.	Tiliaceae	*mo'osipo*		(1,3)

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Triumfetta procumbens Forster f.	Tiliaceae	mo'osipo		(1,3).
Vanilla planifolia Andrews	Orchidaceae	vanila	vanilla	fruit dried and cured as an export crop (1,5,9).
Vavaea amicorum Bentham	Meliaceae	ahivao		(1,3)
Vernonia cinerea (Linn.) Lessing	Compositae	fisi puna		(1,3)
Vigna marina (Burmann) Merrill	Leguminosae	lautolu tahi		leaves used medicinally (1,2,3,4,8).
Vigna sesquipedalis W.F. White	Leguminosae	pini	yard-long bean	fruit cooked cut up in stews, soups, curries, etc. (1,6,7).
Vitex trifolia Linn. var. bicolor (Willdenow) Moldenke	Verbenaceae	lalatahi		leaves used medicinally; wood for firewood (1,2,3).
Vitis vinifera Linn.		kalepi	grape	fruit eaten (1).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Wedelia biflora (Linn.) de Candolle	Compositae	*ate*		leaves used medicinally (1,2,3,4).
Xanthosoma sagittifolium (Linn.) Schott	Araceae	*talo tea*	yautia, tanier, American taro	tubers cooked as a staple vegetable; leaves cooked as a green vegetable (1,6,7).
Xanthosoma violaceum Schott	Araceae	*talo Futuna*	yautia, tanier, American taro	tubers cooked as a staple vegetable; leaves cooked as a green vegetable (1,6,7)
Ximenia americana Linn.	Olacaceae	*vitahi*	hog plum	fruit eaten occasionally (1,3,5,6).
Xylocarpus granatum Koenig	Meliaceae	*lekileki*	cannon-bell tree	bark used medicinally; timber used for fence poles and general construction; fruit used as a ball for children (1,2,3,4,8).
Xylosma orbiculatum (J.R. and G. Forster) Forster f.	Flacourtiaceae	*filimoto*		wood used for house construction (1,3).

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Scientific Name	Family	Tongan Name(s)	English Name(s)	Uses
Zea mays Linn.	Gramineae	*koane*	maize, corn	fruit cooked and eaten (1,3,6,7).
Zingiber officinalis Roscoe	Zingiberaceae	*sinisā*	ginger	used as a spice in soups and curries (1).
Zingiber zerumbet (Linn.) J.E. Smith	Zingiberaceae	*angoango*		rhizome used medicinally; sap used to make a poison (1,2,3,4).

Tongan words used in description of uses:
kali - a carved wooden pillow.
kava bowl - carved wooden bowl used with the traditional beverage *kava*.
sisi - a traditional sash or garland made of flowers and leaves.
ta'ovala - a traditional mat-like garment worn around the waist.
Tongan oil - scented coconut oil.
'umu - underground oven.

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757 hortensia Forster var. simplicifolia [Rech.] K. Schumann).

/43/3. Toothache. You pulverize the root of the plant te'e [824] te'e manu, wrap it in a piece of kaka 'i niu (a brown, natural bast tissue at the base of the leaf stem of the coconut palm, which envelopes the lower part of the coconut palm leaves), then place this bag in a bowl (cup) of hot or warm water, squeeze it out several times and rinse your mouth with the liquid, then spit it out. [276] Chewing Tongan tobacco is often substituted for this treatment.

4. Earache. If a visible inflamation (pimple, boil) seems to be the cause, the person administering the treatment uses uhi leaves and "tongan oil" (its preparation p. 62). If the cause of the pain cannot be determined, he takes only Tongan oil, warms it in a small spoon over a flame and lets a few drops fall into the painful ear of the patient. Then he closes the ear opening with a piece of soft tapa or wool.

5. Inflamed eyes (red eyeballs). The leaves of heilala or fisi'uli are chewed, wrapped in a piece of white tapa, a little warm water is added and the liquid is dripped into the patient's eyes.

6. Cough. The bark of the toa tree (Casuarina equisetifolia L.) is grated, wrapped in kaka 'i niu (see no. 3). mixed with cold water and the liquid is given the patient to drink. Sometimes the bark of the fekika tree (Eugenia malaccensis L.) is used together with the bark of the tui tui tree (Aleurites moluccana [L.] Willd.) in the same manner.

7. Stomachache (colic). The bark of the ngatae tree (Erythrina variegata L. var.) and of the mohokoi tree (Cananga odorata [Lam.] Hook f. and Thomson) are pulverized, then mixed in a kaka 'i niu sheath (see no. 3) and put in a cup (bowl) of cold water which is then given the patient to drink.

/54 cont./

> 291 older ones and 25 younger ones) wore a
> 177 *vala*, whereas nine (one older and eight
> 178 younger ones) dispensed with it. A similar count in the small village of Fungamisi, which borders on the urban seaport of Neiafu/Vava'u, showed 20 Tongan women (eleven older and nine younger ones) with the *vala* and five (two older and three younger ones) without it.

291 In compliance with the wishes of early missionaries, no Tongan
177 woman is now seen in public with naked breasts. Even ten-year-old
797 girls bathe fully dressed. However, in the villages of the small
(515) islands young women and girls still work in their huts with naked
(184) torsos, and some of the village women's naked breasts thrust through
(831) torn undershirts and tattered blouses probably have a more provocative effect on the male inhabitants than did the natural, unclothed female torso of former days. For, the well-meaning puritanical missionaries were unable to go on providing for the constant supply of costly, full
291 covering. Since the Tongan woman scarcely knows how to take care of her
296 clothes--she will actually go into the bush wearing a new silk dress--and cannot keep acquiring new ones, the female everyday clothing on the small islands is often quite untidy. Things are better in the seaports,
292 (184) and the Sunday-best of Tongan women throughout the Archipelago is pretty immaculate. For church, festivals, etc., women wear a *ta'o-vala* (like the male population) over their dresses; often this is also replaced by the lighter *ta'o-vala kie-kie* (136)

> (824) (294) (176) 136. The *ta'o-vala kie-kie* is a narrow belt plaited of strips of pandanus leaves (*lou tofua*-like) with a black design, and with pendant strips plaited in the same way. It was "invented" some years ago as the colleges and soon became popular with women, and sometimes also men. See p. 308-310 for how it is made.

and a bast belt, the *mana fau*,(137)

/54 cont./

292 [824] (294) 137. This is plaited from bast of the Hibiscus tiliaceus, has long, pendant bast fibers and is entirely in natural color. See pp. 321/324 for method of production.

as well as the much-worn kie-kie lou fau. (138)

[824] (294) 138. A belt likewise plaited on Hibiscus tiliaceus bast, with long pendant bast fibers, but more artistic and dyed with European colors (for instance, crimson, purple, blue, pink, green, vermilion); also a variation called kie-kie Lopa decorated with red tree seeds (Adenathera pavonina). See p. 323-324 for method of production.

291 Tongan women still commonly go barefoot. Some wear sandals or *white tennis shoes, more in the seaports, naturally, than on the small* [177) islands. A few also struggle with European /55/ women's shoes. --Turbans made of undyed tapa (feta'aki) sometimes temporarily wound /around the head/ as a protection against the sun are reminiscent of similar head coverings of times past. (139)

139. Cf. J. Dumont d'Urville, Voyage pittoresque... loc. cit. II. p. 78.

292 177 Hats (tata lou 'akau) (140)

140. Cf. pp. 320-323.

292 [824] (294) plaited of leaf strips of pandanus (lou tofua and lou kie), which older women only wear for church and younger women and girls also on other festive occasions or merely as a sun shield on Sundays, go back to mission influence. (141)

141. The "sun hats" mentioned by Cook (J. Cook, Beschreibung...loc. cit. VI. p. 280) were very probably different.

[794] They were introduced at that time by missionaries for women and girls who had made a confession, as a sign of their membership in the congregation.

294 296 178 Among the new tasks of sewing, washing and mending, (142)

/56 cont./

291 177 178 Thus the field of clothing shows how old indigenous cultural assets and new imported ones exist side by side and in part have been blended to a unity that seems natural to the natives. The Tongans adopted the European fabrics because they are far more practical (washable and more durable) than tapa, because, with their printed patterns and the brilliant colors some of which they had never seen before, they seem desirable, and because they are products of Europe which they admire. Convenience was a lesser consideration, [296] [432] [287] for the money for purchase of the fabrics must be earned, keeping them clean requires assiduous care, and the tapa continues to be laboriously made--for festivities, as sleeping mats, etc.--to such an extent that in most villages of Tonga, and even in the "chief city" of Nuku'alofa one can still hear the pounding of the tapa mallet almost every workday.

/57/ It is doubtful whether in future the vala will be replaced altogether by trousers and the short dress. Though for certain work, trousers are much more practical than the vala, yet the latter is easier to make, to put on and to clean, and above all more comfortable in the warm climate. To judge by the present state of affairs, the majority of Tongans will probably retain the vala. Certainly it will continue to exist in the exalted realm of solemn occasions and festivities--provided the Tongan government does not officially introduce a different development in the wake of special Europeanization measures.

Adornment

301 178 The adornment of the Tongans has also undergone a change. Today the natives adorn themselves relatively little compared to the wealth of adornment mentioned in the old sources about Tonga. [237] [824] In the pre-Euopean and early European era there were necklaces of snail shells,

/57 cont./

301 178 237 824 hollow bird bones and shark's teeth, as well as chest ornaments of mother-of-pearl shells, upper-arm circlets of the same material and bracelets of tortoise shell; in pierced earlobes bits of tortoise shell, small rods of bone or reed were worn. (147)

(113) 147. Cf. J. Cook, Beschreibung...loc. cit. VI. p. 281; G. Forster, loc, cit. IV. p. 327; J. Dumont d'Urville, Voyage de la Corvette L'Astrolabe /Voyage of the corvette L'Astrolabe/ ...Histoire de Voyage /Story of the voyage/. vol. IV. Paris 1832. p. 285; while Cook says that this adornment is worn by both sexes, Forster allots it to the men and the rest of the ornaments to the women.

Almost all this belongs to the distant past, and of course one no longer sees the chieftain's headdress made of tail feathers of the tropic bird and of red parrot feathers, (148)

148. J. Cook, loc, cit. p. 186.

nor the exquisitely plaited coconut fiber belts decorated with red feathers, (149)

149. An old dance dress of Tongan women (G. Forster, loc. cit. pp. 337- 342.

and women's side combs artistically fashioned of small rods and coconut fiber. (150)

150. G. Forster, loc. cit. p. 328.

301 565 237 The old sources do not indicate how this adornment was distributed among the various classes. However, it may surely be assumed that at least the mother-of-pearl chest ornament was worn by the privileged noble, (151)

[113) 151. Cf. M.L.A. Milet-Mureau, Voyage de la Perouse autour du monde /Voyage of the Perouse around the world/. vol. I. Paris 1797. p. 301.

who was also the only one privileged to wear the neck ornament carved out of whale's teeth (152)

301 /57 cont./

565 152. Cf. J. Martin, loc. cit. I. p. 311 ff;
239 H. Plischke, "Ein Brustschmuck von Tonga-
(113) tabu und die Verarbeitung von Walknochen in
Polynesien" /A chest ornament from Tonga-tabu and how whalebone is worked in Polynesia/ in Nachrichten von der Gesellschaft der Wissenschaften zu Gottingen, Philologisch-Historische Klasse. Fachgruppe II, Mittelalter /?/ und Neue Geschichte. New series. vol. II no. 7. 1939. p. 137.

and the large feather-headdress. (153)

153. Compare J. Cook, loc. cit. p. 280.

301 The causes for the disappearance of this ornament are probably to
177 be sought in the general deterioration of the old crafts which in
178 Tonga (as on the other islands /58/ of Polynesia) began with the
797 import of European goods and tools, as well as in the attitude of the
puritanical missionaries who were surely not favorably disposed toward adornment.

301 Nowadays Tongans prefer perishable plant adornment. The neck-
824 laces (kakala) of blossoms, leaves and seed capsules familiar since
(178) ancient times and already mentioned by Cook, (154)

154. J. Cook, loc, cit. p. 281.

Ellis, (155)

155. W. Ellis, An authentic narrative... /cited in English/. loc. cit. p. 94.

and Dumont d'Urville, (156)

156. J. Dumont d'Urville, Voyage de la Corvette L'Astrolabe.../Voyage of the corvette L'Astrolabe/. loc, cit. IV. p. 285.

are worn by young men, girls (also women) and children on many occasions. (157)

157. For example, at festivals, cooperative work

/58 cont./

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(house-building, making large lengths of tapa). Young girls usually make them by stringing together the large whitish-yellow *pua* blossoms (*Fagraea berteroana*) and the small *huni* blossoms. (158)

158. Frequently also the red pandanus seed capsules.

on a hibiscus bast thread. The *sisi kakala* likewise worn by young men, girls and children (sometimes also by older persons) at festivals, but around the waist and sometimes also around the shoulders, are made by girls and women, usually out of the blossoms of *pua*, *heilala* and *pipi*, out of the leaves of *tane-tane* (*Polyscias* species) and *maile* (*Alyxia* species) and out of the seed capsules of *paongo* (*Pandanus* species) and *pipi*, all of which are similarly strung on a bast strip of *fau* (*Hibiscus tiliaceus*). (159)

159. A typical arrangement consists, for example, of *pua* blossoms, *pipi* blossoms, *pipi* seeds and *maile* leaves; sometimes they make artistic *sisi kakala* of threaded blossoms and leaves which are interspersed, for example, with other smaller blossoms on the ribs of coconut pinna.

Often they also simply put a blossom (for example *pua*) behind one ear as an ornament. Old and young Tongans of both sexes like to wear an arrangement of *fatai* (a Liana) around their necks as an ornament and for coolness, whenever it suits them.

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[535]

Only at dances (160)

160. For instance, *tau'olunga*, *laka-laka* *ma'ulu'ulu*, *kailao*.

necklaces of snail shells (*kahoa hihi*, *kahoa pueki*) are occasionally worn. Finger rings of tortoise shell, already mentioned by Cook and Ellis for Tonga, (161)

161. J. Cook, *loc. cit.* p. 281; W. Ellis, *loc. cit.* p. 94/95.

/58 cont./
301 237 are also seen nowadays on some Tongan women and a few men. But they
301 have been altered by inlays of silver ornaments (rhomboids, crosses,
237 dots) obtained from melted silver coins. Several Tongan "experts"
326 in Nuku'alofa and Neiafu make these rings which are dispersed from the
301 seaports throughout the Archipelago. Inventive Tongans make rings out
177 of a tortoise shell substitute, namely the black celluloid rims of
326 bicycle pumps, and also decorate them with silver designs. Occasionally
301 one sees tortoise shell bracelets which in /59/ workmanship and
[237] inlays resemble tortoise shell rings and in shape are simple spirals.

Some Tongan women own gold finger rings (162)

[177> 162. A few Tongan men also wear these in imitation of the European custom of wedding rings.

and gold and silver bracelets; a few have necklaces of the same
301 material. This European adornment has not become very widespread
177 during the last decades. The gold rings were heavier in the recent
past than the ones preferred nowadays. Among the few "durable
ornaments" worn nowadays we must count the plastic combs which some
Tongan women wear in their hair and which to some extent replace
the beautiful old rodlet combs. (163)

163. G. Forster, *loc. cit.* p. 328.

302 The only survival of face painting seems to be the coloring
of cheeks with the blood of freshly killed pigs that is sometimes
practised by young boys.

301 The colorful belt of hibiscus bast, *kie-kie lou fau*, (164)

292 164. See page 323.

535 which was mentioned under clothing and which often replaces the *ta'o-*
824 *vala* of women and girls, may also be regarded as adornment, as may the
dance shirts worn by Tongan women on the occasion of big dances, (165)

/59 cont./

301 165. For example, kofu lou fau knotted of
292 colored hibiscus bast for the laka-laka,
535 ula and tau'olunga dances; kofu lou 'akau, of
824 white tapa (feta 'aki) with mohokoi leaves
(Cananga odorata), which are stitched on with
hibiscus bast for the laka-laka and ma'ulu'ulu
dances; sala sipi-sipi of tapa (feta'aki) dyed
with European dye for the laka-laka, ma'ulu'ulu
tau'olunga dances. Dance shirts are also made
of white tapa (feta'aki) studded with shimmering
shells or red seed capsules. For dances some
/women/ like to adorn themselves with maile
leaves (Alyxia species) around neck, waist and
wrists.

and the tapa vala trimmed with leaves, worn on similar occasions by
women and by the men who may possibly take part. In the kie-kie lou
292 535 fau, the dance shirts and the dance vala, old and new cultural assets
177 are fused, the Tongan basic material and ancient basic forms being
301 "enriched" with European dyes, imported plants and novel form elements
(for example, sleeves, decorations).

301 There is no longer a distinction made between nobles and commoners
184 565 in the realm of adornment.

In general, it made be said of today's adornment in Tonga that
301 177 the former varied richness it represented for the native has gone and
178 was in no sense replaced by European cultural assets. The plant
adornment, as well as the (partly altered) dance garments are the
only important vestiges which, to be sure, are still very much bound
up with Tongan life.

/60/

Tattooing

304 In the art of tattooing there was an even greater change, which
[178] [182] we may characterize as degeneration.

In ancient Tonga all men, with the exception of the highest
dignitaries, (166)

166. Probably on account of special taboos.

/126 cont./

342 (113) 346. On the subject of ancient Tongan house building: J. Cook, Voyage dans l'Hemisphere Austral.../Voyage in the southern hemisphere/. II. p. 68; the same, Beschreibung.../description/ loc. cit. VI. p. 285; G. Forster, loc. cit. V. p. 139; W. Ellis, An authentic narrative... /cited in English/. I. p. 95; J. Martin, loc. cit. II. p. 279 ff.; J. Dumont d'Urville, Voyage pittoresque /Picturesque voyage/... II. p. 78; Tischner, Die Verbreitung der Hausformen in Ozeanien /The dissemination of house forms in Oceania/. Dissertation. Hamburg 1934. pp. 93/94, 139, 177.

and traditions give us no comprehensive insight into the ancient Tongan dwelling. However, we know that it was a long house with rounded narrow sides. The average house of a chief was approximately 30 feet long and 20 feet wide. (347)

347. See J. Cook, Beschreibung...loc. cit. VI. p. 285.

342
335 Four (or six to ten) posts were connected with a longitudinal beam on which rested four (six) crossbeams which, with their projecting ends, supported a ridge roof /127/ that was additionally held up by special supports on the framework. Nails and mortise were unknown.
[284]
(824) The beams were lashed together with cords of coconut fiber; these were of different colors (natural-colored, black, red and yellow), and the individual, careful lashings represented "geometric" patterns.
342
824 The roof at the top was about 12 feet high and extended to about four feet beyond the floor. It was covered with sugarcane leaves or--more simply--with coconut leaves. These were plaited together like mats and were fastened like tiles to the rafters. The ancient
342 Tongan dwelling very probably had no walls. As a protection against rain, wind, or lower temperatures, the better houses had curtains of mats fastened together, which could be lowered, while in the simpler houses people made do with mats which they hung up. (348)

/127 cont./

342
(113)
348. The illustrations in Tasman's Journal (Abel Janszoon Tasman's Journal of his discovery... /cited in English/ Amsterdam 1898; the pictures following the 23rd and 25th January 1643) show houses which do not seem to be storage huts and have (apparently plaited reed) walls which are interrupted only by door openings. These illustrations are in contrast to the data in the rest of the sources (mentioned above).

342 The inside of the dwelling was generally one large room. The floor,
352 which was raised about a foot, was beaten hard and covered with
[824] dried leaves and grasses on which lay coconut palm leaves. Strong
mats plaited of reed and curved semicircularly were set up inside
342 the room to divide it up. The dwellings of commoners (on the plan-
565 tations) were of the same construction, but most probably smaller
184 and simpler (for example, always covered with coconut palm leaves and
without the lowerable mat curtains). Besides the dwellings, there were
344 also rather large meeting houses and guest houses of chiefs, storage
343 houses (with walls that slanted inward toward the floor), cook huts,
and boat houses.

342 In ancient Tonga, house construction had a certain uniformity,
178 with each house built for a special purpose corresponding in its
basic elements to every other one that served the same purpose, whereas
today, as a result of the aforementioned changes, there is a
(177) diversity of types to be seen. Dwellings may be subdivided chiefly
into the ancient Tonga form (long house with rounded, narrow sides)
and the types resembling European construction (rectangular or also
square houses that often have a veranda). Different kinds of building
material result in a number of further variations. These, as well as
the proportion of the different types, may be seen in the following
survey conducted in six villages of the Archipelago.

/128 cont./ DWELLINGS (cont'd.)

	in Haveluloto (Tongatapu)	in 'O'ua (Ha'apai)	in 'Uiha/'Uiha (Ha'apai)	in Pangai/Lifuka (Ha'apai)(350)	in Fungamisi (Vava'u)	in Tu'anuku (Vava'u)
342 Rectangular shape:						
178 177 "Box type," corrugated metal roof and walls....	2			7		5
184 "Veranda type," corrugated metal roof and wooden walls....................................	6	2	21	68	17	21
"Veranda type," corrugated metal roof and walls.					1	

[824] 349. A few coconut-leaf roofs have sugarcane leaves mixed in; a roof very seldom consists entirely of sugarcane.

350. Here "dwelling" includes all houses that at present serve as dwellings or could serve as such, but are, for the time being, used for other purposes (for example, to store copra) or happen to stand empty, but could be occupied again at any time.

351. Two of these houses have only one rounded narrow side.

352. Tin from large zwieback containers.

/129/ The unequal distribution of types may be partly explained by the fact that 'O'ua and 'Uiha are more unfavorably situated for procuring European building materials (timber, corrugated sheet metal, and container metal); moreover, individual house types simply became more "fashionable" in some villages than in others. The survey also shows that the rectangular buildings are mainly made of timber and corrugated metal, and the native raw materials are used more for the old style of building. After all, the European shape generally

/131 cont./

342 22 houses were weaker in construction and more of less simplified and
177 changed. They were built during the following periods:
178

between 1910 and 1920....1
1920 " 1930....3
1930 " 1940....2

between 1940 and 1950....7
1951....9

342 If native materials are used, the roof is almost always covered
178 with coconut-leaf mats (*pola*), which Mariner already mentions for
824 ancient Tonga. (354)

354. J. Martin, *loc. cit.* II. p. 295.

The much more durable sugarcane leaves, which were formerly /132/

/132 cont./

342 the roof covering of the "better" houses, are today only occasionally
178 added to the coconut leaves, and are very seldom used exclusively.
824 The reason is said to be a great shortage of sugarcane leaves which is
(231) allegedly caused by horses that eat the young shoots.

342 Aside from the growing use of new types of building materials
178 (corrugated metal, tin and boards) and nails instead of lashings of
(177) coconut-fiber cords (kafa), one should note above all that the present-day dwelling of "ancient Tongan shape" is no longer "wall-less." The
(824) mats on the weather sides, which could be lowered or hung up, have been replaced, in the types that seem "pure Tongan," by stationary walls that consist either of coconut-leaf mats (plaited halves of leaves) fastened to slender lateral posts, or are made of reed (kaho) which, in a decorative arrangement, is stuck into the ground along the wall line all around the house and is bound together with coconut-fiber cords. Such "stationary walls" seem to have originated a long time ago. (355)

355. For example, Th. West, 90 years ago, described these stationary walls (Th. West, Ten Years.../cited in English/ p. 45.

342 The average house of this type today has three door openings: two
177 opposite each other in the center of the long sides and one on the
178 narrow side that is not part of the sleep section. In some houses whose owners did not have any boards when the houses were built, or who attached special importance to building "purely Tongan," knotted together coconut-leaf mats that can be lowered constitute the "door." On other houses of this type boards are used as door frames to which doors made of boards are fastened with metal hinges. In general, these houses with coconut-leaf or reed walls have no windows. As a result of strong solar radiation, a certain amount of translucence of the

/133 cont./

342
177
178
184

	up to 6m. length & 5m. width	up to 8m. length & 5m. width	up to 10m. length & 7.5m. width	up to 11m. length & 9m. width	over 11m. length & 9m. width
'Uiha.....	5	7	10	9	2
Fungamisi.	8	2	7	3	8 (357)

357. Some of these houses belong to half-castes (Tongan mother - European father).

The average size of a rectangular house is 8.2 meters long and 6.2 meters wide in 'Uiha, and 8.9 meters long and 6.6 meters wide in Fungamisi. (358)

358. Calculated from the individual measurements.

342 178 565 184 Thus the average size of today's Tongan dwelling (for commoners and chiefs) is smaller than that of the ancient Tongan chief's dwelling, which Cook gives as 30 feet long and 20 feet wide; however, it probably corresponds to the measurements of the ancient Tongan dwellings of commoners and may, in part, exceed them. (359)

359. Especially the "low, very small huts" observed by Cook (J. Cook, Beschreibung... /Description/ loc. cit. VI. p. 285); these were most probably the lodgings of commoners acting as servants and living on the properties of chiefs.

342 352 178 [824] The interior of Tongan dwellings has also changed. In the long houses with rounded narrow sides the house still resembles the ancient Tongan model. The floor is covered with dried coconut-palm leaves and grasses (or now simply with sand) and over this are spread mats (takapau) (360)

360. These are already mentioned by Mariner for ancient Tonga (J. Martin, loc. cit. II. p. 294.

342 178 plaited of young coconut-palm leaves. However, in many cases the

/135 cont./

342 (*tufuanga langa fale*). They (with several helpers) erected the chiefs'
463 dwellings and other larger buildings. (363)

363. See J. Martin, *loc. cit.* II. pp. 96. 279.

342 It is to be assumed that commoners mostly built their houses themselves,
565 especially since Mariner reports that everyone knew how to build a
house. (364)

342 364. Ibid. p. 279.

412 The tools used in house building consisted chiefly of various axes with
[237] stone blades and rasps with rough fish skins. (365)

365. See W. Ellis, *An authentic narrative* /cited in English/. I. p. 109; J. T. Plant, *Handbuch*.../Handbook/ II. p. 374.

342 Today almost every Tongan is still capable of building by himself
178 a dwelling with the ancient Tongan ground plan, and there are also a
177 few "laymen" who can erect a European-type house. Besides, there are,
463 as in old times, special house builders living in every village. They
received their training in the traditional way: by working on various
[868] house-building projects they gathered knowledge and experience. A few
342 were trained, European-fashion, as carpenters (for example, in Fiji).
178 Therefore, as a rule, they own an assortment of good English tools (for
177 example, axes, hatchets, adzes, saws, hammers, drills, planes, chisels,
463 caulking irons, screwdrivers, files, clamps, angle irons, levels, tape
412 measures, etc.). Among the rest of the house builders, European axes,
335 transverse hatchets with iron blades and large European machetes, as
all-around tools, replace the equipment customary in ancient Tonga,
which has long since disappeared throughout the Archipelago.

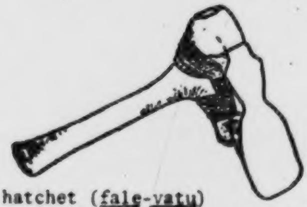
412 /136/ The big axe (*toki lahi*) is used to cut down trees and cut
[824] up and split trunks. It is usually bought readymade in the commercial
centers of the Archipelago; sometimes the natives acquire only the blade
(approximately 19 centimeters length and 11.5 centimeters maximum width)

/136 cont./

412 and make the handle themselves (length 85-90 centimeters) out of wood
[824] of the *toa* tree (*Casuarina equisetifolia* L.).

There are various transverse hatchets; the iron blades are bought
[177] and then hand-shafted as desired. To make a *fale-vatu lahi* the
(439) natives like to take an ordinary European hatchet blade of the type
(824) which was formerly traded in Tonga by German commercial firms, and
provide it with a forked-branch shaft of the *feta'u* tree (*Calophyllum*
[284] *inophyllum*). The blade which lies crosswise is fastened (lashed) with
(283) coconut-fiber cords (*kafa*) that are drawn through the eye (provided
for the handle by the European factory). The blades necessary for such
[439] transverse hatchets can at present no longer be bought from merchants
in the Archipelago; the ones in use, which some of their present
owners have inherited from their grandfathers, are therefore

[284]



Transverse hatchet (*fale-vatu*)
with European blade (Expedition Collection, No. 102)

of special value and handled with great care. Sometimes the rear
abutment on the shaft, which has to absorb the blow, is protected against
splintering by having some six nails driven in. In a typical specimen
of the *fale-vatu lahi*, the measured length of the blade was 18 centimeters and the maximum width 15 centimeters, the length of the handle
[342] was 47 centimeters. In house-building, longitudinal grooves are cut
(335)

/136 cont./

412 into the coconut-palm pieces of trunk with the fale-vatu lahi in order
(342) to make the rafters (kahoki) (see below). This transverse hatchet--
(335)
(322) with the same shape and shaft--also occurs in a smaller version known
as fale-vatu si'i, and is used preferably to "plane" the rafters
(chip off unevenness). The toki taha-taha and the toki tele are used
412 for the same purpose. The smaller hatchets (handle length about 30
177 centimeters) have European planing blades, again mounted crosswise,
284 with the cutting edge fastened to a forked branch with a kafa lashing.
824 Here too the handle usually consists of feta'u wood. In the case of
the toki tele are used for the same purpose. The smaller hatchets
(handle length about 30 centimeters) have European planing blades,
again mounted crosswise, with the cutting edge fastened to a forked
branch with a kafa lashing. Here too the handle usually consists of
feta'u wood. In the case of the toki tele, parts of a coconut husk are
used as a blade cover. Another small transverse hatchet (handle length
25 centimeters), the toki unga ko, may be mentioned. Here a European
gouge approximately 20 centimeters long with its curvature resting on
an insert of toa wood is attached with a kafa lashing to a feta'u
forked branch. Owing to the insert, this blade can be turned and thus
makes possible various semicircular cuts.

The transverse hatchets mentioned here are often also bound with wire (or hemp) instead of the coconut-fiber cords.

412 These transverse hatchets are an interesting fusion of ancient
177 Tongan and European tools: the natives have generally replaced their
stone blades /137/ with the various more efficient metal blades, but
have retained the old Tongan type of shaft so that they can use the new
tool for their traditional working methods (see below). (366)

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366. The transverse hatchets are used not only in house-building, but also in woodwork generally (for example, boat-building, see p. 351-353).

/137 cont./

412 The large machete (hele pelu) is generally bought readymade [439] (total length 60-70 centimeters), and is easily obtainable in the commercial centers of the Archipelago. The knife tip which is bent slightly upwards is usually cut off. [824] The frequently broken handles are skilfully replaced by self-made wooden shells (feta'u wood). This machete is an all-purpose instrument. In house-building it serves for the most diverse tasks wherever something needs to be cut, knocked off, or leveled (planed), and for many Tonga it replaces the small transverse hatchet. Beyond that, the knife has a wide range of uses in the hands of men, women and children, from cutting finger- and toenails to various tasks on the plantations.

342 Many Tongans (especially commoners) feel it is important to erect 463 what they regard as a well-built, solid dwelling on their property, and 331 secure the help of a specialist who carries out the work with several helpers (relatives of the "owner," his friends and other villagers). If, later, a second house is needed on his place, he usually builds it himself (alone or with the help of members of the family and other relatives or friends).

In 'Uiha/'Uiha (Ha'apai), in 1952, 76 dwellings with ancient Tonga ground plan were carefully examined.

342 Of these, 54 were built by house builders (or Tongans who were 463 regarded as house builders). Until recent times their work was acknowl- 465 eged only with food. In only seven cases was the builder paid with money 331 (sums between 8 and 40£T.); four of these cases involve an impoverished refugee from Niu Fo'ou who, in 1951, worked only as house builder in 'Uiha, hence these cases should be regarded as exceptions. In two cases that took place 50 years ago, the builder was remunerated with mats and tapa, while in a case that occurred 30 years ago a rather large quantity of coconut-fiber cord (kafa) was given.

342 The remaining 22 houses were built by natives who are not special-
463
331

/139 cont./

000 (Fungamisi). As a result of the growing use of European building
342 materials for the old-style Tongan houses and especially as a result
177 of the introduction of the European-style houses, however, money takes
436 on an increasing importance for the procurement of material in house building.

342 A Tongan who plans to build a house must of course, decide where
423 it is to be located. If he has not yet obtained property in the village
425 (*api kolo*) (371) from the government and does not wish to build on the property of a relative, he must hand in a proper request to the authorities for the
342 assignment of a plot of land. Meanwhile he will soon start building preparations, for these take a fairly long time. The preparations--as in former times--consist chiefly of procuring the building material and obtaining food supplies to feed the workers.

342 /140/Making sufficient quantities (several thousand meters) of
283 coconut-fiber cord (*kafa*) for lashing the framework and for fastening
824 the coconut-leaf covering is still an important prerequisite for building a dwelling in ancient Tongan style. The natives gather large
283 coconuts with especially long husks (*niu kafa*), remove these and divide them into four (eight) pieces which they place in a basket weighted with stones and lay in a shallow place in the sea for about a month. Then they beat them on a block of hard wood (or on a stone) with a stick or *toa* wood 30 to 40 centimeters long, in order to loosen the fibers and remove the crumbly material between them. After the fibers have been dried in the sun they are rolled in small bundles (372) with the palm of the hand on the naked thigh (or between two palms),

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371. See p. 173.

372. From 5 to 25 fibers each, depending on their thickness.

/140 cont./

283 and then the three-strand cord is plaited from these small bundles.
283 This method of preparation probably corresponds to the ancient Tongan
178 procedure except for two deviations: In the old days it was probably
generally customary to "bake" the coconut husks in an earth oven and
only then to place them in the sea; occasionally this complicated
method is still used today by leaving the husks (wrapped in koko
leaves) (373) for hours or days (up to one month) in the earth oven--soon grown cold--and thereafter keeping them in sea water for two or three weeks.
[171] Secondly, in former times, the natives probably wound the little fiber
bundles with a single fiber before plaiting them, as is occasionally
still done in Samoa; this procedure is slower, but guarantees
greater durability of the cord.--Making coconut cords is men's and
[462] women's work, but is done mostly by the men. Often, several men do
[574] the plaiting together, and they also like to do this work in the kava
[276] gatherings. However, the cords are much less often made than they
were even a few decades ago when one constantly saw men plaiting kafa
in the kava circles. In those days they apparently also liked to lay
in a supply, and the demand for better built houses of ancient Tongan
[461] style was probably greater. Today, three men plait up to 200 meters
of coconut-fiber cord in four hours (as a day's output). In this
way three people can, in three months, make the necessary amount of
kafa for a rather large house of ancient Tonga style, whereas they
finish this work for a small house in less than a month--if they
persist in plaiting their quota every day.

373. Bischofia javanica Bl.

342 A further concern of the Tongan who wants to build a house in
313 the old Tongan style is to procure the posts and beams. The Tonga
[824] Islands are poor in lumber, and if a person does not have a few koka
[439]

/140 cont./

342 trees (*Bischofia javanica* Bl.) or *toa* trees (*Casuarina equisetifolia*
313 L.) at his disposal on his plantation (bushland)--as in old times--
[824] and does not wish to sacrifice valuable breadfruit trees to make posts,
[439] then he must go to an uninhabited island where--again as in old ways--
he will look for suitable trees, or else he will buy imported Canadian
or New Zealand building timber which, moreover, is preferably used
342 instead of coconut palm trunks for the beams. To build a house in old
177 Tongan style, which is supposed to have board walls and be covered
439 with corrugated sheet metal, and especially to put up a European-style
construction, a person must, in good time, buy enough corrugated metal, imported wood, nails and possibly cement in the commercial centers of the Archipelago and transport them to his native island in the small cutters.

342 /141/ Since a man must generally supply food for the specialist
264 (in case such a one is building the house) and all his helpers (other-
574 wise the orderly course of the work might easily be endangered as a
result of growing apathy), he must, in due time, raise quantities of food plants and, in addition, depending on the size of the understaking, fatten a number of pigs. If a man does not wish--or is not able--to offer hospitality in this ancient Tongan style, he must have in readiness sacksful of flour and sugar, large cans of corned beef, tea and, if possible, loaves of bread, in order to provide meals.

342 After all preparations have progressed to the point where they
331 can guarantee a steady flow of work, the day is set for the building
to begin. The work force assembles on the day announced; the work begins.

The following account of the building of a house in November/
[177] December 1951 on Nomuka may show the juxtaposition (or fusion) of old
[178] and new:

/145 cont./

177 the floor (which consists of coconut-leaf mats [takapau] placed over
352 the sand or dried leaves, or of boards [see above]) is more or less
covered with seat mats (papa = coarse mats of pandanus leaves,
lou paonga) (377)

377. Size approximately 2.60 x 0.75 meters; construction see page 305-307.

upon which the finer floor mats and sleep mats of the lo taha type are
353 sometimes spread. In some houses the roof construction is covered over
352 with tapa. Along the walls stand a few crates, boxes or chests,
177 baskets, also traveling bags and often a small food cupboard (with
415 screening). In front of, or on top of, these containers, in which are
kept clothing, utensils and smaller supplies of various kinds, lies
the bedding (mats, bast-fiber covers [sheets], pillows) of several
352 house occupants, which is rolled up during the day. On a small table
354 there are often a glass kerosene lamp, a few glass bottles with Tongan
415 oil, a mirror, etc. The bed of the master of the house (married couple)
177 is usually partitioned off with a tapa or cotton curtain (sometimes
352 also with a board wall). (378)
353
177 378. In houses with an ancient Tonga ground plan it /the bed/ is usually located in one of the rounded ends.

Here there are more containers and mat beds or a European-type bed.
353 Many Tongan interiors are decorated with strips of colored crepe
177 paper, photographs, magazine and newspaper pictures.--Such furnishing
are today typical for houses with ancient Tongan ground plan, as well
as for most of the European-type constructions.

352 A complete Tongan bed consists today of a simple sleep mat of
285 the lo taha type, another placed over it of the fala tofua type and
513 a sleep mat of the fala paongo type spread over this. (379)

(824) 379. The mats are made from leaves of various pandanus species; their size varies from

513
285
[352] /145 cont./
(824)

about 1.10 x 1.30 meters to about 1.70 x 2.60 meters. For their construction see pp. 305 ff.

However, people often sleep on a single mat. There are no specific data on /146/ the sleep mats used in ancient Tonga. [565] It is to be assumed that commoners slept on simpler mats than did the nobles. [178] Very probably the mats are in general plaited more crudely now than [531] in the old days (380)

380. For example, there are no longer any sleep mats of the quality of the old Tongan mat No. Oz. /oceania?/ 141 (Cook Collection) in the Institute of Ethnology of the University of Gottingen.

and the lo taha and fala tofua, in contrast to the fala paonga which is always in natural color (brown), are decorated not only with the traditional black plaited pattern, (381)

[386] 381. Dyed black with leaf strips buried in the mud of a bog for two or three days and boiled with manaui leaves.

but also with European colored woolen threads knotted on the borders. 513 Some Tongans spread a European white sheet over their sleep mats; but [177] only a few cover themselves with these or with wool blankets. The majority still use (especially on cooler nights) the traditional bast-fabric sleep covers. (382)

382. Perhaps these are today used more by commoners than in the past.

513 The ancient headrests, however, are gradually falling into disuse. One 352 still finds them used by a few older men and women. Some own the 178 typical Tongan headrests (hahapo) made from one piece, very few have the four-footed headrests (kali), the legs of which are fastened to the headrest in pairs with coconut-fiber cords; more commonly used than these beautiful old types (383)

/147 cont./

352
177 personal wealth, and it often gives him the comforting assurance that
(556) he will always be able to receive a white guest properly.
(574)
Among the rest of the household effects, the wooden, multi-
415 footed kava bowl along with the coconut mugs have a prominent place
178 in most houses, as in the old days (391)

391. On the custom of the kava drink see pp. 143-149.

422 Almost every household also owns a roll of tapa from which pieces are
412 cut off as needed. For sweeping, the natives still use a broom (tau
824 fale) made of the ribs of pinnate coconut leaves, coconut-fiber cord
and a stick of hibiscus wood. The old Tongan lamps, /148/ in which
354
178 coconut oil was burned, like the more frequently used torches, have,
177 however, long since disappeared. In every house one sees European
kerosene lamps, and the modern benzol pressure lamps are also rather
372 widely used. In the villages, matches have altogether replaced the
179 old method of rubbing fire; it is only on the plantations that fire is
178 often produced in the old way, (392)

392. On the long side of a trunk of Hibiscus tiliaceus (tolonga) approximately 80 - 100 centimeters long, which has been flattened with a knife, a pointed rod (kaunatu) of the same wood is rubbed back and forth with both hands, under steady pressure and with mounting speed so that the sawdust that gathers at the bottom of the trough gradually grows hotter and finally starts to smolder; tinder (for example, a dry coconut husk) can thus be ignited. The process usually takes 20 - 25 seconds; 15 seconds were said to be "record time."

415 with which very many Tonga are still familiar. No Tongan uses
177 bottle gourds any more for storing liquids. Glass bottles of various
178 shapes and colors are taken for granted in all Tongan dwellings.
000 Almost all Tongan households also have smaller or larger mirrors, and

/156 cont./

412
241 415. J. Cook, Beschreibung...loc. cit. VI. p. 284.
177 was replaced chiefly by two tools that have iron blades: The huo spade consists of an oval iron blade, approximately 14 centimeters long, 12 centimeters wide and provided with a socket approximately 17 centimeters long which is stuck onto a strong wooden handle about 1.50 meters long. The natives buy the blade from a shopkeeper and
[432] make the handle themselves out of toa wood (Casuarina equisetifolia L.);
[824] in a way, this tool represents the old digging stick, but is more efficient. (416)

416. Th. West already mentions it in 1865. (Th. West, Ten years...p. 146); a smaller huo spade with an iron handle is seen more seldom.

The huo lafa-lafa is a slightly angular thrusting iron (length approximately 13 centimeters, width approximately 18 centimeters, socket approximately 13 centimeters long) with its socket set on a wooden handle (approximately 1.70 meters long); the natives buy the tool ready-made from a shopkeeper and of course replace the handle themselves if it breaks. The huo lafa-lafa is used chiefly for slashing weeds on the plantations, sometimes also for digging in loose ground. The large machete (417)

417. See p. 203.

is also extensively used on the plantations, to cut down tough weeds, to harvest various crops, etc. /157/ /Illustrations appear here./ /158/ Sometimes a regular European pitchfork is used to loosen the ground (for example, in planting the stalk-cuttings of the sweet
241 potatoe); one seldom sees European spades or shovels. The ancient
412 Tongan digging stick has survived, in a sense, on the smaller islands
178 where, on the plantations, the natives cut a piece of wood about two
184 meters long, whittle it at the end by one-sided blows with the machete and then use it as a huo langa to break up (loosen) the soil in planting kape (less often taro or yams).

[TEXT CONTINUED ON PAGE 236]

/160 cont./

244 machete (also with the huo spade or the huo lafa-lafa) about a foot above the ground and with this stub they pull the tubers (which are barely 50 centimeters long) out of the ground and dig farther for those they have not pulled out. [251] The tubers must be used up soon, since they keep for only two or three days.

The manioc planted in Tonga for food is not noticeably poisonous. The natives take no precautions. [824] [287] Only the manioc often used nowadays to glue bark cloth is poisonous and is carefully stored away from domestic animals.

talo = Taro (Colocasia esculenta Schott)

[262] Taro is one of the ancient cultivated plants of the Tongans (423).

423. See J. Cook, Beschreibung...loc. cit. VI. p. 237; W. Ellis, An authentic narrative... I. p. 89.

but in the past, as today, it has never had great importance in the diet of the natives; the Tonga Islands are too arid for a extensive taro cultivation. Nevertheless, the natives take the trouble to plant a certain amount of taro. They distinguish between three main varieties.

[221] Planting time is from June to September (seldom to December), but particularly during the months of August and September. The native cut down and burn the weeds on the land where they propose to grow taro. [462] Here too the subsequent "sweeping" of the residue is often done by the women, whereas all the rest of the work is the business of men. Sometimes they also plant taro after the yam harvest in the holes of the harvested tubers or together with the yams. They dig the planting holes for taro approximately 30 centimeters deep with the huo spade and place in them pieces approximately 12, 15 centimeters long) of the rhizome-like taro stalk. The planting holes are then covered with earth in such a way that a depression of some ten centimeters remains, so that in case of rainfall the water can gather in it. A simpler, more

/162 cont./

245 huo spade they dig holes approximately 50 centimeters deep (diameter 25 to 30 centimeters) in which they plant a sprig (root sucker). They fill the plant hole with earth so that a depression remains in which water from rainfalls can accumulate. The distance between plants is about five meters on a flat area. Every three weeks or so they remove the proliferating weeds with the huo lafa-lafa. After six to nine months the first fruits can be harvested.

niu = Coconut Palm (Cocos nucifera L.)

824
178 Since the settlement of the Archipelago the coconut palm has played a very special role in Tongan culture. At the present time in particular, in view of its extraordinarily manifold uses, (426)

426. The following list will show the all-purpose uses of the coconut palm in Tonga; ("old") and ("new") indicate whether or not its utilization was already common in ancient Tonga.

[262]
[[illegible]52]
[231]
[303]
[372]

1. The meat of the nut (kakano 'i niu): eaten in pieces by the natives (old); grated (or squeezed out as coconut milk) for preparing foods and beverages (old); grated to feed chickens and pigs (old), used in pieces to feed pigs (old) and horses (new); used for making copra (new); the oil obtained from the meat is used to make hair oil and body oil (lolo Tonga) (old), to fry in a pan (new) and to burn as fuel in the absence of petroleum imports (old).

[272]
[262]
[264]

2. The water of the nut (huhu'a oe niu): especially of unripe nuts is drunk by the natives (old); in an unripe nut it is stirred together with the meat and eaten (old); used at meals to wash one's fingers (old).

[415]
[372]
[524]

3. The hard shell (Endocarpium) of the nut (nge'esi niu): used for making drinking mugs (old); as fuel (old) and (as charcoal) to heat flat irons (new); used as a child's toy su nge'esi niu ("coconut shell shoes," see p. 272) (new).

[283]

4. The husk (Mesocarpium) of the nut (pulu): used to make cord (kafa) for house and boat building, for fastening blades to tools etc. (old); used as cover for hatchets

824 /162 cont./
178 (old); serves to deep fire smoldering (old); as
(372) fuel (old). "Towel" (old), "toilet paper" (old)
(752) and to clean shoes (new): the fibers are also used
(524) to press out the grated coconut meat (old); the
juice of green, warmed husks and the crumbly material
between the fibers of old husks are used to treat
wounds (old); used for making children's toys
(sailboats) (new?).

(352) 5. The palm leaves (*lou niu*): used, as is, to sit
(285) on in the bush (old); used to make floor mats
(372) (*takatapu*) (old), fans (old), baskets (old), hats
(for example, *helemeti* and *tata faka-polis*) (new);
needed to make house walls and roofing (old); used
in dry form as fuel (old).

(285) 6. The center rib of the leaflets (*tu'a niu*): used
(287) in plaiting baskets (old) and fans (old) and in making
(412) tapa stencils (see p. 328); used in making brooms (old).

(482) /163/ 7. The leaf stems (*tome*): used as carrying sticks
(372) (see p. 250) (old); in dry state as fuel (old); also
used to keep fire going (smoldering leaf stem wound
with tapa) (old).

(287) 8. The bast fiber at the base of the leaf stem (*kaka 'i
(415) niu*): used to make tapa stencils (under side) (old) and
as a bag for squeezing medicines and food (old).

(313) 9. The wood or the trunk (*sino oe niu*): used to make
rafters and roof laths (old); used as posts and beams
in houses (old?), as single posts on the plantations and
for palisades (old).

(278) 10. The bark (*kili oe niu*): used to make medicines
(for stomach pains) (old).

(227) 11. The roots (*aka oe niu*): used to plait fish baskets
(278) (traps, *finaki*) (old) and to make cuttle fish hooks
(tailpiece) (old); the juice of roots serves as medicine
for abdominal pains and headaches (old).

it maybe designated as the most useful plant of the /163/ Tonga Islands.
245 Cook reports that he came across coconut palms on Tongatapu "in astonishing numbers." (427)

427. J. Cook, Beschreibung...*loc. cit.* VI. p. 237.

476 /175 cont./ On a rope some 500 or 1,000
226 (even 2,000) meters long the natives fasten coconut palm leaves so
[824] that they project. While one end of this rope remains on the beach (or reef), two or three rather large boats (cutters) take the remaining part and ride out to sea with it and then come back to the shore, thus spreading it out in a large semicircle that extends into the ocean. Some 50 or 80 persons take part in the entire undertaking. They then pull the rope back to shore, that is to say, they make the semicircle smaller. Young natives dive, in order to free the rope that might be caught on the rocks at sea bottom. As soon as the semicircle has become small enough, the net is doubled and finally tripled. Since the coconut leaves move in the water while the work on the rope is going on, the trapped fish are afraid to escape through the leaves. They are crowded together more and more and then driven into a large and heavy funnel-shaped net (tuki) plaited of coconut fibers, secured with sticks and /176/ weighted with stones. Several hundred, indeed as many as 1000 fish (the length of an arm
[225] or a hand) can be caught in such a haul. There may even be turtles and sharks (which are immediately speared) among the booty. In the fishing methods described thus far the fisherman uses up his catch alone with his family, and sometimes gives a portion to neighbors or other villagers, whereas the distribution of an uloa catch is a special event: the headman of the village, the pastor, possibly Europeans of the vicinity, all those who took part in the work, and, in case of a very large haul, the entire village are given their share.

226 talaki:

This is a small net, approximately one or one and a half meters long. It is fastened to two sticks and has several weights. With
[462] this hand net, held by the ends of the sticks, women fish, particularly

/177 cont./

226 a few hours (or at the next ebb tide) the catch is taken in.

Fishing with a Weir:

pa:

In shallow water the natives erect weirs made of posts and wire netting, in specific directions, so that the fish are induced to swim through the entrance posts into the marked-off corners; they can only swim in, but cannot get out again (used especially in Tongatapu).

pola:

276
476
[824] In this method of fishing, which is a large community undertaking, very many people take part. On a sand bank on the shore, at ebb tide, a large chain of plaited halves of coconut palm leaves (pola) is laid out in a semicircle (with its opening toward the shore) and is partly buried. At flood tide the people approach the enclosed area from the outside, erect the "weir" of coconut palm leaves and prop it up with clubs. Hundreds of people, indeed more than a thousand, of both sexes and all ages then wait on the outside of the weir until the water recedes, to make sure that no fish excape. When ebb tide has commenced all the natives, at a given signal, enter the enclosure where there are great numbers of fish in the shallow water and in pools. They are caught and killed (usually with spears).

226 /178/

Fishing with Poison:

'aukava:

[824] The bark (or fruit) of the futu tree (Barringtonia species) is pounded between stones, or the bark of the kava shrub is grated, a bag (kaka 'i niu [see page 68] or cotton) is filled with the meal, the bag is wrung out at ebb tide in the water-filled hollows of the reef, and after a few minutes the killed (or stunned) fish come to the surface.

/179 cont./

226 though it has by no means displaced them. Even now, for example,
177 the casting net (*kuenga sili*) is still, as in old times, (463) a very important piece of fishing gear, especially among the Ha'apai group. Among the ancient Tongan fishing methods, however, bonito fishing (from a boat with bamboo pole, tow-line, hook and fiber bait) (464) has disappeared.

226
178 463. See J.J. Labillardiere, *Relation du voyage... /Account of the voyage.../* II. p. 113/114; W. Ellis, *An authentic narrative...*I. p. 109; Th. West, *Ten years...*

464. See J. Cook, *Beschreibung...loc. cit.* VI. p. 286/287; J. Martin, *loc. cit.* II. p. 342/343.

227 A change took place, chiefly with respect to the material used
286 for making the fishing gear. With the exception of *tuki* (see above
177 under /180/ *uloa*), no fish net in Tonga is today knotted of indigenous
178 material. (465)
(824)
(439) The natives use imported European twine which can be bought from
227 shopkeepers on most of the islands. Now and then they even acquire
177 ready-made nets in the department store of the chief towns. Most fish nets nowadays have weights made of lead instead of the traditional coral-stone sinkers; they buy the lead from merchants, heat it and pour it in the shape of a plate which they cut into small pieces that are bent into tubular shape and used as weights around the edge of the cord of the net. The natives prefer lead sinkers because they are
227 heavier than coral stones and make handling the net easier. The float,
178
824

465. Formerly, the bast of the *olonga* tree (*Tonchaedia*) in particular (see J. Martin, *loc. cit.* II. p. 279), coconut fiber cord (*ibid.*) and the bast of the *fau* tree (*Hibiscus tiliaceus*) (see Th. West, *Ten years*...p. 119) were used for net knotting.

/180 cont./

227 however,--usually of fau (Hibiscus tiliaceus) wood--is still made
178 exactly as it was in olden times. In the uloa community fishing
824 expedition they use the heavy net plaited of coconut fibers, as they
always have, since the available hemp material seems to be too weak
[177] for this purpose. However, the long rope required for this procedure
[283] is scarcely plaited any longer of the fau bast; they buy an imported
227 European rope. The fish spears today have iron points with barbs;
177 they buy the prongs ready-made from a shopkeeper or have them made by
178 a blacksmith in one of the chief towns. The points are inserted in
the spear shaft and fastened with a wrapping of European fishline.
[824] The ancient Tongan fishlines plaited of coconut fibers (466)
[283]

466. See, for example, J. Cook, Beschreibung... loc. cit. VI. p. 286.

have long since disappeared. Today the natives use the European
[237] lines available in quantities from shopkeepers, just as they use
exculsively the steel fishhooks introduced by whites and have
apparently forgotten the traditional, beautiful hooks of tortoise
shell and mother-of-pearl. (467)

467. Ibid.

226
416 Benzol pressure lamps have largely replaced the torches formerly customary in night fishing. The traps (finaki) on many islands are
177
227 already made more often of wire netting than of the roots of coconut
177 palms, and there is scarcely a Tongan who goes to the trouble of making
[824] the weirs (pa) of bamboo and plaited coconut palm leaves, but generally uses wire netting for this purpose as well. Finally, some of the
501
178 boats used in fishing are still the traditional outriggers (popao,
177 rarely tafa'anga) (468)

468. See p. 349 ff.

but some are also rowboats and European-type sailboats which have re-

/180 cont./
501 replaced the ancient Tongan catamarans (kalia). (469)

178 469. Natives of Vava'u also use the motor boats
177 belonging to Neiafu merchants in fishing
with the towline (fakatele).

226 /181/ The sandals (teka) plaited from the bast of the fau tree
292 (Hibiscus tiliaceus) are today still worn by the men (sometimes also by
178 the women) when they fish on the rough coral reefs.
824

415 Fish are transported in part in the traditional fish baskets
226 ('oa) plaited of young coconut palm leaves; (470)

824 470. These are apparently the ones Mariner refers
177 to in his account (J. Martin, loc. cit. I.
p. 309.)

however, they often use European bags, while the small fish--apparently
according to ancient custom--are strung on sticks stuck through their
heads.

286 According to Mariner (471)

463 471. J. Martin, loc. cit. II. p. 96.

(178) net-knotting in ancient Tonga was a hereditary craft. Nowadays, to all
appearances, it is not, though in every village there are a few
natives (especially older ones) who are able to make fish nets. As in
[824] old times, they use a knotting shuttle (netting needle) (hika) which
(237) is carved from the wood of the tao tree (Casuarina equisetifolia L.)
or of the milo tree, or a sperm whale bone, and a measure for the
meshes (mata kupenga) cut out of tortoise shell or fau wood (Hibiseus
tiliaceus). An old razor blade serves as knife. They buy the
[965] necessary amount of twine for making the net and ask one of the
experts to knot a fish net; usually his work is acknowledged with a
small gift (for example, tobacco). Since they are thus dependent
227 on the work of a specialist and the twine also costs a certain sum of
[463] [426] money, not every household nowadays owns nets; they lend them to each
[178] other. The situation was probably similar in ancient Tonga, through
the supply of fish nets was in general probably greater.

/191 cont./

252 on the amount of food to be stewed; its diameter is approximately one to one and a half meters, its (center) depth approximately 30 - 60
252 centimeters. On the bottom of the pit they arrange dried coconut
372 leaves in layers and over them the husks and shells of ripe coconuts (or wood); on top of this they place a great many stones. (488)

[823] 488. They prefer volcanic rocks; however, since these must at some time be fetched from the uninhabited volcanic islands of the Archipelago, they often also use the less effective coralline rocks that are easily obtainable everywhere.

They set fire to the coconut leaves, husks and shells (or wood) and heat the stones; in order to make these red-hot they add more fuel. Finally, the stones that have sunk to the bottom of the pit seem hot enough; with a long stick they scrape the remnants of burned-up fuel out of the "earth-oven" and distribute the stones evenly around the bottom and the wall of the pit up to the top edge. The
252 food which has meanwhile been prepared is then placed in the earth-oven: they will place, for example, the cut-up yams, kape, manioc, etc., on the stones (489)

489. On these they sometimes first put a protective layer of waste after peeling.

and spread over them an insulating layer /192/ of coconut husks. On
(415) these they place pouches made of banana leaves (490)
(824) 490. These banana leaves they prepare by splitting off the center ribs and holding the leaves over the fire so that they become tough and resistant; the bundle (pouch) is tied with the rib part that was split off.

which may, for example, contain cut-up taro leaves (= "vegetable"), fish or corned beef (or a chicken) and coconut milk (squeezed out of the grated coconut meat). They also add pieces of pork to the cut-up tubers, and on special occasions, as in old times, (491)

/201 cont./

245 The copra knife (hele hihi niu) is about 35 centimeters long; the
412 wooden handle and the steel (iron) blade are each one-half the total
[432] length. The natives usually buy the knife in the shops of the chief
towns and then replace the handle with a self-made one (of feta'u wood=
[824] Calophyllum inophyllum) that has a longer, slanting end so that the
[325] hele hibi niu can lie more comfortably in the hand; sometimes they also
make the entire knife themselves by heating an old blade or corresponding piece of metal in the fire, shaping it with hammer blows on a hard stone, then working it with a file and finally giving it a wooden handle which they attach with nails.

245 Afterwards, they dry the meat in special drying huts (fale fakamomoa niu) for approximately 24 - 36 hours.

245 The drying huts "German New Guinea type" /cited in English/ were
258 not introduced in Tonga until after the second World War. The natives
themselves build them. On top of an iron cask lying on the ground and open at both ends (or on two /202/ casks joined to form a longer tube) they place a wooden grate (with an interspace of about one-half meter). The whole is encased in longitudinal walls and a roof of plaited coconut leaves. In the cask (or casks), which sometimes also has a side vent, a fire is built, fed with coconut husks and shells, which produces great heat and little smoke and dries the meat spread out on the grate.

245 Thereafter, the natives cut the coconut meat into still smaller
258 pieces, spread these out once more in the sun for a day; finally, they
432 fill bags with them and store them in the storage hut or the dwelling
until there is an opportunity to drive or sail to the nearest receiving station of the Tonga Copra Board /cited in English/; if they near such a station they simply fill their traditional coconut-leaf baskets with copra and take them immediately to be sold.

/205 cont./

1. Floor Mats

285

takapau:

[352] In every dwelling built in ancient Tongan style, the floor (sand) is covered with these mats. They are approximately 1.50 x 0.50 meters in size.

[824] Women make the takapau from the young leaves of the coconut palm by tearing off on either side of the palm leaves part of the midrib with the pinnate leaflets hanging on it; then they interweave four of such "leaflet rows" into a mat (consisting of two joined halves).

The mats are dried in the sun and may be used for about four or five years.

2. Seat Mats

papa:

[574] These are rolled up and stored in the dwelling and on special occasions (for example, visitors) they are spread out on the takapau (in a European-type house on the wooden floor); however, even on ordinary days the natives often sit on them. They are about 2.60 x 0.75 meters in size. Seat mats for one person (papa nofo'anga tokotaha) are today used now and then for meetings (fono), choir practice and in some churches.

[824] The papa are made from the pandanus species, lou paongo. The natives cut its leaves, keep them in a shady spot until they are brown, then remove the thorny edges, cut the midrib, divide the leaves along these and roll the halved leaves into rather large bundles (up to about 100 halved leaves) which they store (hanging) in the house. Before plaiting they make them soft and pliable [412] by stroking them with a shell or, for example, with the bowl of a broken European tablespoon; with a shell splinter or a piece of tin

/205 cont./

285
[412) they cut them into strips from which they then plait the papa.

3. Sleeping Mats

lo taha:

[513) The lo taha is the most ordinary sleeping mat and often serves as the bottom mat of a complete bed for girls, women and men. It is also /206/ placed over the papa as a seat mat. On journeys (by boat) it is usually the only sleeping pad. Its size fluctuates around 1.80 x 1.10 meters.

[824) The lo taha is generally made of the pandanus species lou tofua.
From the cut leaves the natives remove the thorny edges and part
of the midrib with a knife; then they roll the leaves into rather
large bundles (of about 40 leaves each) until the leaves change
color. Thereupon the leaves are dried in the sun (about four to six
days). Then they divide them along the midrib into two halves and
store these rolled up (as many as 100 halves per roll) or separately.
(412) Before plaiting them they draw a mussel shell or the bowl of a spoon
over the leaf halves thus prepared, make them soft and pliable and
cut them into narrow strips with a sharp shell splinter, a small
piece of tin or a knife. The lo taha are often ornamented with
[386) interwoven uniform black strips which have been suitably dyed by
[824) being buried in the mud of a bog (for about three days) and boiled
[531) with manaui leaves (and kokoa leaves, or also tavahi leaves). For a
[531) few decades these mats have also been ornamented along the edges with
[177) knotted, colored European wool threads.

fala tutu'ila:

The fala tutu'ila is also a sleeping mat and similar to the lo taha in kind and use.

It is made of leaf strips of the lou tutu'ila pandanus species which is not boiled, but simply dried in the air, like the lou paongo

/206 cont./
285 species (see papa).

fala paongo:

[513] This the natives prefer to use as the inner mat layer of a
complete bed. It is also used separately as a sleeping mat, and
[352] when it gets old it is often used as a floor mat. The fala tofua
[431] is further used in gift-giving, and in burial, to lay the corpse to
[764] rest. It varies in size with an average measurement of about 1.90 x
1.20 meters.

[824] The mat is plaited of the leaf strips of the lou paongo species;
these are prepared as for the papa (see above), but are cut much
[531] narrower. The fala paongo are not specially ornamented.

fala tofua:

[513] This is the most important sleeping mat and is used by men, women
and children. As part of a complete bed it serves as the uppermost
[431] layer of mats. It a favored wedding gift, and at a burial the corpse
[585] is laid to rest on it.
[764]

Like the lo taha (see above) the mat is plaited of leaf strips
[824] of the lou tofua species; however, the strips of the former are
used double, whereas for the latter they are worked in singly. Leaf
strips of the lou paongo species (see papa) are used as the favored
ornamentation.

4. Belt Mats

285
ta'o-vala tofua:
291

This belt mat--like all the others--differs from the sleeping
mats in that the plaiting is considerably finer and smaller in size.
[554] /207/ It is the most commonly used of these symbols of respect and
rank, (534)

534. See p. 69-71.

[824] and is worn especially by men, but also by women. The ta'o-vala

/207 cont./

285 tofua is plaited out of leaf strips of the lou tofua species (for its
291 treatment see above under lo taha). This belt mat is dyed yellowish
[824] brown with a mixture of burnt coral limestone and the juice of green
[386] coconut husks (or sea water) and then pressed under the sleeping place.

ta'o-vala la (ta'o-vala tapa i'la):

The ta'o-vala la is also worn by men (and women). It differs from the ta'o-vala tofua chiefly in not being rectangular like the latter, but resembles a triangular sail (la); (535) it is also plaited out of lou tofua leaf strips and dyed like the ta'o-vala tofua.

535. There are also ta'o-vala which are made of three smaller triangles linked together.

ta'o-vala kie:

285 This is the most valuable belt mat. Among commoners, men and
292 women use it only on especially important occasions (for example, at
565 festive church services and as part of the wedding garb of bride and
(178) bridegroom). According to a generally well-informed native on Nomuka,
(643) only the hau (i.e. the king and those of royal blood) were permitted
(644) to wear the ta'p-vala kie in ancient Tonga. Today, however, as a result of democratization, the majority of commoners own them; yet the old order is still alive insofar as a person who wears a ta'o-vala kie, except on the most important occasions, is unpleasantly conspicuous in the eyes of these natives, and is suspected of wanting to show off "as a chieftain."

285 The ta'o-vala kie is made of the lou kie pandanus species.
824 The natives cut the leaves off the plant, remove their thorny edges and part of the midrib, and roll them into rather large bundles (of 20 or 30 leaves) which they boil in a large canister (for about one-half to one hour); then they remove the upper part (upper skin) of the leaves from their lower part and place the former in the sea for

/207 cont./

285 a few days (about seven), desalt them in fresh water, dry them for
[824] three or four days in the sun and roll them up again. Before plaiting
them the natives stretch these upper skins of the leaves, make them
pliable and divide them into narrow strips.

Sometimes the natives smoke-dry this belt mat to make it some-
what darker (that is, yellowish brown). Nowadays, they also some-
[531] times interweave it with lou kie strips that have been dyed with multi-
[177] colored, artificial European dyes.
[386]

ta'o-vala kie-kie:

The ta'o-vala kie-kie is very probably a "new discovery" that is
[291] no more than two decades old. This is not so much a mat as a plaited
belt with pendant strips that are plaited in the same way. Men and
women wear it like the ta'o-vala tofua.

[824] They plait the ta'o-vala kie-kie out of leaf strips of the lou
[531] tofua variety of pandanus (see above under lo taha) and ornament it
with interwoven black-dyed (see above under lo taha) leaf strips of
the same species.

/208/

5. Display Mats

fala fihu:

285 The fala fihu is a valuable mat which is generally not used by
565 commoners, but is stored away and dept for a special purpose. It is
[431] given by a relative or close friend on the occasion of a wedding; a
[585] girl will give it to the man she loves, and a young man will also
ask his sister for a fala fihu to give to a male of female friend as
[585] a special token of affection. At her wedding, a very well-to-do
[292] bride is wrapped in such a mat (but usually of a larger variety known
[764] as "fihu"), and at a burial the corpse is sometimes covered with it.
[513] The daughter of a high-ranking man also sleeps on such a mat.

285 The fala fihu is made from the pandanus species lou kie (see
824 above under ta'o -vala kie).

/208 cont./

000 above under ta'o-vala kie).

kie Tonga:

285 This likewise very valuable mat, today the most finely plaited
292 in Tonga, is popularly worn by bride and bridegroom at their wedding
[585] and also occasionally as a ta'o-vala at important church services and
[565] festivities. A commoner will not wear it when he visits a headman
(in order not to elevate himself), but the nobles themselves may wear
[422] it at all times. In the various villages only a few natives own such
285 kie Tonga. Even today, as in the past, (536)

439 536. See J. Martin, loc. cit. I. p. 162.

178 such mats are bought from Samoa where they are made even better and more
exquisitely; however, the difficulties involved in procuring these in
particular are too great to make possible a general distribution in the
Archipelago.

285 The material for these mats is also the lou kie species of
824 pandanus (see above).

6. Various Mats

pola:

285 By "pola" the Tongan means the coarsely woven halved coconut
[824] palm leaves of specific (rectangular) shapes that are plaited for
[342] various purposes. They are used for the many sections of walls and
roofs of ancient Tongan style dwellings, as well as for the "mat
doors" put together out of several pola. The coconut leaf mattings
(pola kai) (537)

537. Two joined, coarsely plaited halves of coconut palm leaves.

on which festive meals are served should also be mentioned here.

fala tuki kava:

This special mat serves as a pad on which the kava roots are

/208 cont./

285 pounded. (538)

538. See p. 145.

[824] The not very large *fala tuki kava* is plaited out of pandanus leaf strips of the *lou tofua* and *lou paongo* species (see above).

285 824 Besides the mats listed here there are several variants, as a result of the use of various pandanus species. (539)

539. Besides the varieties mentioned: *(lou) tofua*, *kie*, *paongo*, *tutu'ila*, the following are also used: *(lou) kukuvalu*, *falahola*, *tapahina*, *totolo* and *fafa*.

285 178 /209/ This list of the most important mats may show their considerable importance for the various areas of everyday life. However, if today in Tonga we are able to note a considerable wealth of mats with respect to variety and quantity, they do not represent an unaltered ancient Tongan cultural heritage. A certain change has taken place even here. Though we lack specific and detailed data on this, which could be compared with the foregoing list, nevertheless, on the basis of the old sources it may be said that the mats (*la*) used as sails, (540)

540. See J. Martin, *loc*. *cit*. II. p. 294.

the standing mats used to subdivide the rooms of the dwelling, (541)

541. See J. Cook, *Beschreibung*...*loc*. *cit*. VI. p. 285; J. Martin, *loc*. *cit*. II. p. 280.

the weather mats for the open sides of the dwellings, (542)

542. See J. Martin, *loc*. *cit*. II. p. 294.

and the thick hibiscus mats which were worn in boats as a protection against the water, (543)

543. Ibid.

are today no longer made; apparently the natives also no longer use the bast of the banana trunk parasite with which, for example,

/210 cont./

285 (178) important types of baskets plaited today in Tonga:

kato lou niu (kato tokonaki):

This is the simplest basket and the one most frequently made
[462] and used in Tonga. Men as well as women plait it and use it to
[482] transport plantation products, carry copra, etc. They make a kato
[824] lou niu by cutting a leaf from the coconut palm, cutting it in half
lengthwise, coarsely plaiting the pinnate leaflets of one half, making
the whole into an oval and joining the ends of the pinnate leaflets in
a braidlike weave (= bottom of the basket). The entire work is
finished in about ten minutes. They use this basket only once, as a
rule.

kato kai tunu:

[482] The kato kai tunu is used exclusively to carry food. Women
like to use it to bring provisions to members of a work group. This
[824] basket is make by the women from a section of a fresh coconut palm
leaf. They plait together its pinnate leaflets (on both sides) /211/
and then cut (halve) the midrib (main rib) so that they have a folding
basket. Two handles (made of two times two pinnate leaflets) are
fastened to it.

'oa:

[482] This basket is used especially to carry fish, but also to
transport fruit, mussels, sand, copra etc. Women usually plait the
[462] 'oa, but men also do this work.

[824] Such baskets are similar in shape and in the way they are worked
to kato lou niu (see above), but are plaited much finer out of young
coconut palm leaves (work time approximately one-half to one hour)
and are used for several months (by both sexes).

kato lou 'akau:

[482] The kato lou 'akau is used for carrying, and now and then also

/211 cont./
285 for safe-keeping, utensils of all kinds. The natives place in it
482 tobacco, cigarette papers, small knives, oil bottles, combs, mirrors
and diapers (=kato tanaki'anga me'a) and, in the larger ones (kata vala)
articles of clothing; they also use it to shop at the storekeeper's,
and in smaller baskets of this type children carry their schoolbooks,
adults their bibles and hymn books. The kato lou 'akau is used
[462] almost exclusively by women (and girls), and the women (and girls) are
also the only ones who plait it.

285 This basket, which has a rectangular bottom and two loop handles,
[824] is made of strips of pandanus leaves. It has an inner section plaited
of wider lou paongo strips, and around this is worked an outer section
[531] from a lou tofua strip that is equally wide at the bottom and narrower
at the sides; (554) these strips are sometimes of natural color, sometimes dyed black
(see above) and plaited into "geometric" patterns.

554. For the method of making various pandanus-leaf strips see under "papa" and "lo taha," pp. 306/307.

kato tongi:

This is similar to the kato lou 'akau. The use of both baskets
[824] is the same. The kato tongi is plaited of wider strips of lou paongo
(and lou tofua) and differs in its long sides which are drawn out to
two rather long points.

kato tu'a niu:

[482] The kato tu'a niu is used to transport fruit and food and to
keep sewing gear and sewing work and other utensils. Like the
kato lou'akau, it is an all-around receptacle used for many purposes.
[462] Women and girls use and make it exclusively.

This round basket with a handle (with or without a cover) is
[824] plaited from the midribs of the pinnate leaflets of the coconut palm

/211 cont /

285 and from narrow pandanus-leaf strips of the lou tofua species (see
[824] above) in a spiral coil technique. "Geometric" patterns are worked
[531] in with black dyed (see above) lou tofua strips and natural colored
lou paongo strips.

/212/

kato lou kie

[482] This small pouch with a handle is used to hold money, tobacco, matches, etc. It is carried only by women and girls who like to take it along when they go shopping.

The kato lou kie is plaited by women and girls from pandanus strips (upper skin) of the lou kie species, (555)

555. See ta'o-vala kie, p. 309-310.

some of which are dyed with European colors.

kato alu

[585] The kato alu is a "wedding basket" for a wedding of some importance in ancient Tongan style. (556)

556. See p. 114-116

There are two shapes: a smaller, oval one for the bridegroom and a larger, round one which was originally intended for the bride.

[462] These baskets, which are made only by women, are plaited with
[824] the separated midribs of the pinnate leaflets of the coconut palm
and the split leaf ribs of the creeper alu. They are dyed with a
[386] mixture of the soot of burned Aleurites and the sap of the koka tree
(Bischofia javanica [flower]). With thin strings twisted from the
[283] bast of the paper mulberry tree, small rings cut out of shells (or
[237] snail shells [pule] with coconut fiber strings) are fastened to the
[283] outer surface of the basket. The carrying cord is plaited out of
[237] women's hair.

285 From the foregoing list of the most important types of baskets
177 we may conclude that the natives expend considerable time, effort and
178

/213 cont./

285 Among Tongan plaitwork we must also include the fans (for cooling off on hot days and to drive away mosquitoes and flies), which are still made in large numbers and in different varieties. A summary of the most important types may give a general idea:

i lou niu:

This, the simplest of the fans and is used by old men and women, though young men and women also use it, and children play with it. (462) Only women make it. They plait these fans out of sections of young (824) coconut palm leaves, the pinnate leaflets of which they separate lengthwise.

i tu'a niu:

The i tu'a niu is used particularly by old women and men, though younger natives also use it.

(462) (824) It is plaited by women (girls) from the center rib of the pinnate leaflets of the coconut palm, from strips of the lou tofua species (561)

561. See p. 307.

(in natural color and dyed black) or of the lou kie species. (562)

562. See p. 309-310.

For the handle, the midribs of prepared coconut palm leaves are used, or a wooden stick is worked in to reinforce the handle. (563)

(237) 563. Sometimes the natives also wind women's hair around such a handle.

Occasionally the edge of the fan is trimmed with chicken down.

i lou 'akau:

(462) The i lou 'akau is a simple fan used by women (girls) and men and plaited only by women (girls). They make it out of leaf strips (824) of the lou tofua speices of apndanus and usually plait in a wooden handle.

/213 cont./

285 *i fulu fulu 'i moa*:

[293] This is the typical "good" fan of females, especially girls; they like to use it in public, in church, at choir practice, etc.

[462] Women and girls plait it of pandanus strips of the *lou tofua*
[824] variety (as well as *lou paongo*); (564)

[531] 564. See pp. 306-308.

according to the old style, they work in *lou tofua* strips dyed black or tinted (for example, crimson) with European dyes. A wooden handle is
[237] plaited in as reinforcement, and the entire edge of the fan is trimmed with white chicken down.

/214/ *i lou fau*:

[462] The *i'lou fau* is used mostly by women, but also by men, and is made by the former.

[824] They use the midribs of the pinnate leaflets of the coconut palm, leaf strips of the *lou tofua* (or *lou kie*) variety of pandanus and
[177] hibiscus bast (*fau*). The latter is usually colored with European dyes.
[386] A wooden handle is plaited in as reinforcement. Sometimes they also
[237] fasten chicken down to the edge of the fan.

285 Without doubt, these are products that are basically of ancient
[177] Tongan origin. In the absence of comparative material it is difficult for us to determine how great the change is in this area. In any case,
[439] the frequent use of European dyes, as well as the bits of imported construction timber used to reinforce the handle are recent influences.
[178] Probably the more "elegent" fans (for example, *i fulu fulu 'i moa*,
[565] *i tu'a niu*) were reserved for nobles in ancient Tonga, and in general we may assume that the work has perhaps become cruder.

Finally, in a discussion of Tongan plaitwork we must mention sandals and hats.

/214 cont./

Sandals

teka:

285 These are an ancient Tongan cultural heritage. Today, as in the
292 past, they are worn on the sharp-edged coral reefs by fishermen
(sometimes also by women).

285 The men (not so much the women) plait these sandals from the bast
462 of Hibiscus tiliaceus. Nowadays, they sometimes also use (for con-
824 venience) the less durable leaf strips of pandanus.

Hats

285 The occasional wearing of hats may be traced back to European
177 influence. Hence the plaiting of such head coverings is also a new
291 type of work in Tonga.

tata lou 'akau:

292 These hats are worn by older women when they go to church; they
794 are a sign of membership in the Wesleyan congregation where the
wearers have made a special confession. Younger women and girls
wear these hats not only for church-going, but also on other festive
292 occasions, and as sunshades on Sunday. In the opinion of one Tongan
177 who is in general well informed, hats have been made in the Archipelago
for about 40 years and are an imitation of models taken from the
(Europeanized) Niue Island where indeed very similar models are
plaited to this day.

285 /215/ The tata lou 'akau are made only by women from the leaf
462 strips of the lou tofua pandanus species; (565)
824 565. See lo taha, pp. 305-308.
531 they plait patterns into them with pandanus leaf strips of the lou kie
species, (566)

566. See ta'o-vala kie, p. 309.

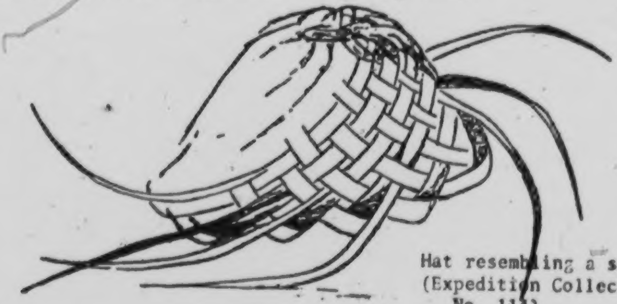
dyed with European dyes, and put a band of cotton around the hat.

/215 cont./

285 tata fakapolisi: Hat resembling police caps.

292 helemeti: Hat resembling sun helmet.

These hats and those of other shapes are sometimes quickly plaited by young Tongans on the plantations from halved coconut palm leaves, and are worn as a protection against the sun or as a quaint (178) adornment. They are "inventions" of recent times.



Hat resembling a sun helmet
(Expedition Collection,
No. 114)

Typical women's plaitwork is the making of various ornamental belts.

mana fau:

This simplest ornamental belt may be worn on all special occasions (church-going, festival, etc.) by girls and women (and boys) in place of a belt mat (ta'o-vala, see above). Perhaps this bast belt is a recent introduction or a new creation which may, however, be several decades old.

285 283 824 [462] Women and girls make the mana fau from the bast of Hibiscus tiliaceus. With the machete men and women (girls) usually cut several small trunks (some 15 or 20) of this tree which grows only wild; the women (girls) scrape off as much as they can of the outer bark with knives, pieces of broken glass, etc., and place the slender trunks into the sea for two to four weeks; this loosens and make pliable the rest of the bark-bast layer so that it can easily be pulled

/215 conf./

285 off (all around) in one strip. After it has dried in the sun for
283 about two days /216/ the white bast (= on the inner side of the re-
824 maining bark) is removed. This the women (girls) divide into narrow
strips and therewith knot the mana fau which is actually only a strand
of bast slung around the hips, from which the bast fibers, knotted to
it in close succession, hang down to below the knees.

kie-kie lou fau:

292 The kie-kie lou fau is worn especially by women and girls,
though sometimes also by men. They wear it instead of a ta'o-vala
(764) to church, when visiting chiefs, for festivals and other occasions,
(574) and for dances (laka-laka, ma'ulu'ulu, hula hula, tau'olunga, hula,
(535) ulu); they also decorate fresh graves with it.

285 This ornamental belt which originated only in recent times (end
292 of the last century?/ is made by women and girls, likewise out of
(462) hibiscus bast, and consists of a plaited belt cord on which are
(824) knotted long, narrow bast strips that hang down. It usually has
(283) special knotted ornaments in the hip section (for example, bast
(777) strips tied into rosettes), and parts of it, in contrast to mana fau,
(386) are always dyed with European dyes (particularly green, lavender, pink,
and blue).

kie-kie pueki:

292 This ornamental belt, which is also worn by women and girls
(438) (and occasionally by men) in place of the ta'o-vala, is a typical
product of the island of Niua Toputapu situated in the very northern
part of the Archipelago. It may be an ancient cultural heritage.

292 The natives there make the kie-kie pueki, like the mana fau, of
237 hibiscus bast (with long pendant bast strips); all around the hip
(283) section, however, they knot snail shells on a band about eight centi-
(285) meters wide. The snail shells, which are whitish-yellow in their
(777)
(386)

292 /216 cont./
237 natural state, are today occasionally dyed with European dyes (for
177 example, crimson) for ornamental arrangements.
386

kie-kie lopa:

292 The *kie-kie lopa* is worn by women and girls (more seldom by men)
[535] as a *ta'o-vala*; they also like to wear it at dances (*laka-laka*,
[353] *tau'olunga*, *kailao*, *hula*, *ula*, *ma'ulu'ulu*) and often use it to decorate
their dwellings. This may be an ancient cultural heritage. It is
[462] made by women and girls and consists of a plaited cord of bast
[283] (*Hibiscus tiliaceus*) on which bast fibers are knotted; upon these they
[824] string red *lopa* seeds (*Adenanthera pavonina*?). Today the bast fibers
[386] of the *kie-kie lopa* are also sometimes dyed with European dyes.
(177)

Perhaps the principle of these ornamental belts is an ancient
Tongan cultural heritage. With much love and zeal they are individually
(283) knotted today by women and girls. European dyes are an essential
(386) feature of all of them except *mana fau*.
(177)

287 The bast cloth (tapa) (567)
177
[196)

> 567. Tapa is actually an incorrect designation, though long since established even for the dyed and figured bark cloth (more correctly: bast cloth); in the Tongan language only the non-dyed edge of the bast cloth is called *tapa*, whereas the dyed (figured) bast cloth is called *ngatu*.

is still made in the Tonga Archipelago on a large scale, even though the process is very tedious and in part /217/ entails hard work, and European textiles are relatively easily obtainable for the inhabitants of all the islands.

287 As clothing, however, tapa is used only on certain special
292 occasions; (568)
784

> 568. See p. 66 ff.

178 since the old belief in taboos has been lost, strips of bast cloth are

/217 cont./

287 it off in one strip with their hands.

The pulled-off layer of bast (lou tutu), briefly rolled and stretched so that it lies flat, is exposed to the sun until it is dry. Thereupon it is again rolled up and stored thus.

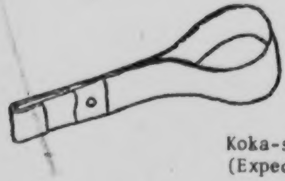
When a woman has enough of this raw material and wishes to beat the bast cloth, she places the rolls of bast strips, the night before she plans to work, into a tub of water for about ten hours. Then, on a slightly curved, smooth (peeled) section of trunk (tutua) (usually of puopua-wood - Guettarda speciosa L.) approximately 15 to 20 centimeters in diameter and 2 to 3 meters long) /218/, which is cushioned by sticks places underneath ('akau lango lango), she beats the moist bast strips with a four-sided wooden mallet (ike). [412] [824] (This mallet the men carve out of toa-wood [Casuarina equisetifolia L.] with a knife; it is about 30 centimeters long; the sides, three of which have grooves of different widths [to stretch the bast strip] and one of which is smooth [to smoothe out the beaten bast] are about seven centimeters wide.) The bast strips are of various sizes corresponding to the size of the trunk; you see some that are one meter long and plus-or-minus five centimeters wide (in the extreme) others, that are 4.5 meters long and 8 centimeters (at one end) to 3 centimeters (other end) wide. As a result of beating (fai tutu) (some 30 to 40 minutes), the strips become larger (for example, stretched to a width of 60 to 80 centimeters). (570)

570. The women also like to pound two pieces of bast, one on top of the other, in order to make better and stronger tapa.

These (rather thin) pieces of bast ("raw tapa," feta'aki) are dried and stored, so that from a greater number of them large lengths of tapa can be pieced together.

/218 cont./

287 Before that, however, the dye must be obtained to dye the tapa
386 lengths. This the women also take care of. From a wild koka-tree
412 (Bischofia javanica [flower]) growing on plantation land, and with a
824 scraper (me'a vau koka) made for his purpose and consisting of a metal band in the shape of a loop fastened to a wooden handle or simply a metal band bent into shape, they first scrape off the outer grayish-brown bark layer, and then scrape a quantity of shavings from the reddish bark layer, which they take to the village in coconut-leaf baskets. (The koka-trees survive this procedure, and the same trees
287 are used again and again.) The bark shavings are soaked in water and
386 then laid upon the open, outspread pressing tube (fau tau koka) plaited out of hibiscus bast) which is thereupon tied up and wound with hibiscus bast. This large, sausage-shaped object is tied together at the ends and hung from a strong tree branch. Through the ring that is formed by the pressing-tube they insert a heavy stick and turn it so that the brown koka-color runs into a vessel placed in readiness. In order to squeeze out the "last drop" two or four women (girls) sit on the two ends of the stick.



Koka-scraper (me'a vau koka)
(Expedition Collection, No. 175)

287 Whereas the beating of the bast lengths is performed by women
386 who work separately or in twos or threes (side by side), and even
461 the koka -pressing is done only by a few women (girls) working to-
476 gether, the making and dyeing (koka'anga) of the large strips is

/233 cont./

501 178 612. Today also with cotton or cement.

and of which only a very few exist in the Archipelago, will probably soon share the fate of *kalai* which disappeared seven decades ago.

501 A *tafa'anga* boat observed on Nomula Iki in December 1951 was built there that same year by a Tongan (from Niua Toputapu) and was used for short trips between Nomuka and Nomuka Iki. The keel was made of wood [824] of the ifi tree (*Inocarpus fagiferus* [Park.] Fosb), the planks and the float were made of *fau* wood (*Hibiscua tiliaceus*), the outrigger poles could not be definitely determined, and the connecting timbers (four) between the three outrigger poles and the float were made of *toa* wood (*Casuarina equisetifolia* L.) . There were holes bored [284] in the planks which were held together with coconut-fiber lashings. Old tapa served as caulking. Two seat boards were nailed on fore and aft. The body of the boat had a coat of crimson oil paint to protect it against sea water. Two paddles propelled the boat.

501 177 178 Aside from the European additions (nails in the seat boards and oil paint) this boat in its rather crude form seemed unchanged from its ancient Tongan model, which had polish-like smoothness and was ornamented, (613)

(113) 613. See G. Forster, *loc. cit.* IV. p. 347;
Tagebuch einer Entdeckungsreise...
/Diary of a voyage of discovery/ translated
by J. R. Forster, Berlin 1781. p. 93.

and used for bonito fishing, no longer practiced today. (614)

614. See Th. West, *Ten years*...p.146.

501 The *popao*, namely the simple (and unadorned) dugout outrigger boats, are the universal craft used for short-distance trips. They usually take on one or two persons and are propelled with wooden paddles (having an oval or pointed-oval blade) or with improvised, trimmed coconut-palm-leaf stems. Sometimes the natives also use a

/233 cont./

501 small sail (made of European cloth, seldom a mat) for which they put
up a small mast. They use the popao to cover the distance between
501 islands lying close together, (615)
505 for various methods of fishing (see above) and, on account of their
slight draft, to board and leave the small sailboats lying at anchor,
as well as to load and unload the latter.

396 The natives like to make the hull of the popao from the trunk of
824 the breadfruit tree (Artocarpus altilis), but they also use the mango
(Mangifera indica L.), the tavahi (Rhus taitensis Guillemin), the
toi (Alphitonia zizyphoides [Spreng.] A Gray), the mohe-mohe and, if
possible, the tamanu. Men who have particular experience in boat-building, but also those who are doing this work for the first time
in their lives, cut the hull of the boat, which is about three to five
meters long, out of /234/ one piece of trunk. They also like to
(438) "export" roughly hewn hulls from islands were the aforementioned types
(435) of wood occur in greater abundance to islands that are poor in them;
on Nomuka, for instance, they pay 10£T.(breadfruit tree wood) to
15£T. (tamanu wood) for such an unfinished boat imported from 'Eua.

396 The owner of the boat-to-be may do the work himself, or a man
(465) experienced in boat-building who is provisioned or remunerated (who
may receive, for examply, 2£T.or a horse) does the work. Often the
(476) men work in twos or threes, with relatives (for example, son, father,
son-in-law, father-in-law, cousin), friends or other villagers helping.
(462) Boat-building is purely men's work.

396 To hollow out the dugout, which has been roughly hewn with axes
412 and transverse hatchets, they use especially the small transverse
hatchet toki unga ko (with the gouge blade, see p. 200-202). They also

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615. They seldom use the popao for greater distances, as did a Nomukan, for instance, who, in 1951, traveled 14 sea miles with it across the open sea.

/234 cont./

396 use the quite effective *toki hoka* that consists of a handle about
412 1.60 meters long and with a larger gouge screwed to one end, with which the wood can be forcefully chipped off. The outer surface of
[177] the hull is hewn with the transverse hatchet *fale-vatu* (see p. 200-202) until it shows the proper curvature and seems almost smoothly planed; if possible, however, they work with a European iron plane.

[284] To attach the two outrigger poles (*kiato*) (616)

[824] 616. For example, from wood of the *milo* tree = *Thespesia populnea* (L.) Solander.

they drill holes with a European drill at two opposite points of the boat's side, enlarge the holes with a red-hot iron, place the outrigger poles (their ends notched with the small transverse hatchet) crosswise over the rims of the boat's side and lash them in this position with coconut fiber cords soaked in water, which are drawn through the bored and burned holes and are tightly and neatly wound and finally pounded firm with a small transverse hatchet (used as a hammer). Sometimes they also connect the two outrigger poles about 0.80 to 1 meter from the hull with a rod (*'akau puke*) (617)

617. Of *milo*-wood, for instance.

lashed to them, in order to achieve greater strength of the outriggers.

396 The float (*hama*) (618)

[824] 618. For example, of *mohokol* wood = *Cananga odorata* (Lam.) Hook. f. and Thomson.

which has already been prepared, with ends tapering to a point, is then provided with four (or five to six) drilled holes (European drill) in the two sections where the outrigger poles are to be fastened; into the holes, trimmed and pointed struts (tuki-tuki) (619)

[824] 619. For example, of *toa* wood = *Casuarina equisetifolia* L.

/259 cont./

> 534 with a diameter of about 40-50 centimeters and
> a slit-width of about 30 to 40 centimeters.
> 534 They are pieces of trunk of the *fehi* (*Intsia*
> 824 *bijuga*), *telie* (*Terminalia* species), *'ifi*
> (*Inocarpus fagiferus* [Park.] Fosb.), *feta'u*
> (*Calophyllum inophyllum*) or *kau* trees, and
> are hollowed out in such a way that the body
> of the drum extends a good handbreadth
> beyond the side walls that enclose the hollow.
> The drumsticks are carved in various sizes,
> usually out of the soft wood of the *tuitui* tree
> (*Aleurites moluccana* [L.] Willd.). It is
> [177] possible that the *lali* was once upon a time
> borrowed from Fiji.

534 which was originally a signal drum for wartime and still exists in
178 large numbers on the islands and is sometimes still made, for it is
202 used where there are no church bells to call together the church-goers
to the services of the various village congregations, and in some places
534 it is used to announce the start of school. At various dances the
177 old drums and other instruments used for rhythm are replaced by
ordinary tin cans beaten with sticks.

For the rest, the natives have adopted various European musical instruments. Guitars especially are very popular; (700)

> [162] 700. On Nomuka (567 inhabitants) were , for
> example, about 20 guitars in 1952, while
> in Fungamisi/Vava'u (263 inhabitants)
> there were about 12.

they are played almost exclusively by young Tongans for group singing
and also to accompany the *tau'olunga* and *hula* dances, for example.
One seldom sees mandolins or violins. In almost every village today
there are also a few mouth organs; the natives like to buy them
shortly before Christmas from the shopkeeper and then organize a
533 small mouth-organ orchestra for the holidays. Chiefly in the large
towns there are brass bands founded by churches. Using European
[177] scores they play on special occasions, for instance at burials and

/269 cont./

000 of Tongan culture.

524 526 177 178 The changes which occurred in this field in recent times as a result of European influences, however, comes close to a collapse. All the aforementioned games of adults, with the exception of lafo and hiko, have today been forgotten. Although lafo is familiar to some Tongans and is occasionally played, now also by commoners, it is rather insignificant compared to other games customary today. Hiko is apparently a children's game more than it was in the past (see below).

European games have generally replaced the ancient Tongan ones. [525] Playing cards are seen today in most settlements, and various kinds of card games (sometimes also played for money, despite prohibition) have 526 177 become known in Archipelago. /270/ But sports have become more widespread. Cricket is today rather popular and, to judge by the cement courts seen in many villages and now partly disintegrated, it was played far more a few decades ago than it is today. The natives like to use bats cut from breadfruit wood and balls made of nonu wood (also, [824] instead of these, moli Tonga = tough oranges). The enthusiasm for tennis varies in individual villages. Young Tongans especially like to play it. They play with home-made wooden rackets that in shape are copied from European rackets (or else with regular rackets) and with European rubber balls or genuine tennis balls which they buy in shops; usually an old rectangular fishnet serves as net. Such tennis games are arranged at any time of the day (except on Sundays) on grassy areas in the villages. They usually do not bother to have a precisely marked-off court, but they try to play "singles" and "doubles" with scores if they know the rules. While tennis in many villages (even on the small islands) is the typical summer game, they devote themselves to football (rugby), which involves more movement, during the cooler time of year. The players are 30 to 40 years old, and they fight with more or less skill for the ball (bought at the shopkeeper's) and the goals. In some

241
245 most important being coconut. The coconut, though representing the
majority of cash-earning export production, is also an important
[262] domestic food source. Coconut flesh and cream are integral parts of
[824] practically every Tongan meal. In addition, products of the coconut
palm are also important to other aspects of Tongan life, from house
construction to production of a shopping basket for marketing.

241
249 A second important supplementary agricultural crop is kava.
276 The roots of this plant are dried, pulverized, and mixed with water
to produce what could be called the Tongan national beverage.
Although the taste is somewhat alien to a non-Tongan palate, the
only observed immediate physical effect of this drink was a slight
[142] narcotic quality.[1] Prolonged consumption, however, was noted to
cause a darkening and scaling of the skin, evidenced in some older
Tongans.

241 A third supplementary plant is the papaya, which is only
245 infrequently cultivated for its fruit, and usually grows totally
262 unaided. While foreigners find the papaya to be a welcome addition
to the principally tuber diet of the Tongan, it is, strangely, a
262 native food viewed with low status. Few interviewees admitted to
231 consuming papaya regularly, and frequently described the fruit as
being pig food.

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[1] On several occasions young Tongan men, having consumed a large quantity of the kava drink, or "Tongan beer" as it is commonly referred to, were observed to be thoroughly intoxicated. However, experience indicated that enormous quantities of the drink are necessary to produce anything more serious than a mild headache. From all indications, the intoxicating effect is quite simply psychological, rather than physiological, although all Tongans questioned will attest to the contrary.

226 deflected into pockets made at corners where they go in and cannot come out again.

3.—Net Fishing.

If nowadays "net fishing" is not such a widespread Tongan method of catching fish anymore, then at least it must have been very popular approximately 75 to 100 years ago, as there are nets in existence made of *olonga* (*Tonchaedia,* resembling *ramie*) reputed to be over 100
[824] years old and still in good condition. A kind of Ficus was also used for making such nets.

(a) *Kupenga fonu* (Turtle Netting). Netting of turtles
225 is mostly carried out in the Ha'apai group where vast areas with prolific growth of seaweeds are found. Shallow water and much seaweed are known as the home of the turtles and this then is the ideal place for turtle fishing. A fisherman having located an area of seaweed between the small uninhabited islands, drops his net in a straight line at right angle to the flowing current and returns home. After two days he goes back to retrieve his net and usually finds turtles of all sizes caught in the net. In a 50 feet by 12 feet net as many as 10 turtles can be expected and often more, depending on the length and width of the net and the area where it is
[286] dropped. These types of nets are usually locally made out of imported seine twine.

(b) *Pa 'Otule* is the netting of the *'otule.* This is a
226 species of fish very similar to the tuna but not more than twenty-four inches long. This species moves about in schools
136 and prefers a sandy beach as a home, for instance the beach
[825] of Pangai or Lifuka. In spite of the activities of the island cutters and sailing vessels, the *'otule* are not scared away
226 from beaches to look for shelter elsewhere. Thus, the netting of the *'otule* is perhaps the easiest of all methods of fishing. A fisherman looking for a school of *'otule* has no difficulty whatsoever in locating them from ashore. He paddles his canoe closely direct to them and drops his 12 feet by 6 feet net in front of the school. He then shifts his canoe behind them and makes a big splash by either rocking his canoe or hitting the water with a long stick. The school, noticing this, dash and escapes with fright in the opposite direction and as many as forty are caught in the

are dropped and sometimes they follow the withdrawn bait to the surface where they are speared.

(c) *Ama* is spearing fish in the night by torchlight.

5.—LINE FISHING.

(a) *Ordinary line fishing* is an old Polynesian method of fishing although with very primitive equipment.

(b) *Fakatele* is trolling a fishing line and hook from a moving boat.

(c) *Seuseu* or *Heuheu* is trolling a fishing line on the surface of the water. The fisherman stands on the edge of the reef and pulls his line from right to left and back again with a very long stick to the end of which the line is attached. The moving hook and bait attracts the eyes of small fish which rush and swallow the bait and hook and are caught without much difficulty. *Huli* is the species usually caught by this method.

(d) *Tautu'u* or *Tautukutuku* is a method of line and hook fishing whereby the boat does not actually drop anchor but drifts over a certain area whilst the fishing line, being weighted by some objects, for instance a piece of iron, is dropped over the side of the boat. The line tends to sink directly under the boat in spite of currents. On touching the bottom it is hauled up to a certain depth to allow the hook to hang just close to the bottom but not actually lying on the sea bed.

(c) *Taulamata'u* or *Taumata'u* is ordinary line fishing whereby the boat is actually anchored. The hook and line is not weighted but is thrown out to be taken away by the current and the hook and bait stop; the smell of the bait is carried far away by the current to lure the fish to the bait.

6.—OTHER FISHING METHODS.

(a) *'Aukava.*. This method is the actual poisoning of fish. The flower of a tree called *masi*, after being cooked in a Tongan oven, is spread on the water to poison the fish in a small bay or inlet. The fish, being poisoned, are forced to come to surface gasping for air. They finally sink to the bottom dead. [824] [276]